

Paul Langerhans' Death Centennial, July 20, 1988

To the Editor:

Paul Langerhans died one hundred years ago, on July 20, 1888, at the age of 41, in Madeira, where he had settled many years earlier to recover from pulmonary tuberculosis.

The cell bearing the eponym Langerhans was first described by him in 1868 [1]. He believed that the gold chloride-positive dendritic cells he described were intraepidermal receptors for extracutaneous signals to the nervous system [1]. Such a hypothesis prevailed for almost a century. Not until 1965, when the morphologic identity between Langerhans cells (LC) and histiocytosis X cells was described, was a possible mesenchymal derivation for LC postulated [2]. In 1968, moreover, Breathnach et al demonstrated that LC do not originate from the neural crest [3]. Further, in the 1970s, a mounting body of evidence was accumulated on the striking similarities between LC and macrophages/dendritic cells, including the ability to migrate [4], the expression of Fc and C3 receptors [5], the anti-HLA-DR reactivity [6,7], and the *in vitro* ability to transfer antigen in lymphocyte stimulation [8]. Finally, less than 10 years ago, the derivation of LC from cells originating in the bone marrow was definitely established [9,10]. Now we know that LC represent the most peripheral outpost of the immune system, thus functioning as a critical link between the extracutaneous environment and the organism [11]. We therefore recognize that LC indeed fulfill receptor-like functions, although of a different nature than originally envisioned by the man who discovered them [11].

Paul Langerhans was born in 1847. He was still in training when, 1 year after the discovery of LC, he discovered the "islet" cells of the pancreas, while preparing the thesis for his degree in Medicine, taken in Berlin in 1869. In the earlier 1870s, he became prosector in pathology and then professor, in Freiburg. After subsequently settling in Madeira for his health, he made a number of zoological observations, discovering and describing several new species of invertebrates, including polychaete worms [12-14] and marine worms [15] occurring in Madeira. The series of papers produced by Paul Langerhans, even on this argument, must be considered as a major, indeed a monumental, contribution to the literature of invertebrates [16].

Just this year, the second international Workshop on Langerhans cells was organized by Jean Thivolet and Daniel Schmitt in Lyon (April 21-22, 1988), and a main lecture by us at the 64th Italian Congress of Dermatology, organized by Alfredo Rebora in Genova (June 2-4, 1988), was dedicated to the LC. Thus, in the centennial of death of this "superb and critical observer" [16], all of us, who are bewitched by the glamor of the LC, join together to pay homage in memory of Paul Langerhans. In fact, apart from Langerhans' discoveries of pancreatic islet cells, of the zoological species [12-15], and even of the granular layer of the epidermis which was called by some authors "Langerhans layer" [17], the first description of LC [1], especially, renders investigative dermatology deeply indebted to Paul Langerhans. Indeed, the recognition of the immunologic significance of LC has stimulated much good and exciting research, awakening the interest of skin biologists in immunology: In a real sense, LC have brought immunology to their doorstep [18].

Paul Langerhans is in direct line with the giants of the history of

investigative dermatology. He "may yet be recognized as an unwitting pioneer of cellular immunology and have his name coupled with that of Elie Metchnikoff" [18]. Indeed, one hundred years after the death of the man who discovered them, the LC are still fascinating cells, and display a critical role in the biology of the skin.

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