This Week's Citation Classic™ CC/NUMBER 32 AUGUST 6, 1984

Martínez-Palomo A. The surface coats of animal cells.
Int. Rev. Cytol. 29:29-75, 1970.
[Laboratorio de Microscopía Electrónica, Instituto Nacional de Cardiología, Mexico City, Mexico]

The paper describes ultrastructural and cytochemical investigations on the peripheral components of animal cells which allow the recognition of two types of surface layers: (1) cell coats located on the outer surface of cells, and (2) basal and external laminas, which border the surface of epithelial and mesenchymal cells, respectively. [The *SCI*® indicates that this paper has been cited in over 255 publications since 1970.]

A. Martínez-Palomo
Sección de Patología Experimental
Centro de Investigación y de Estudios Avanzados
07000 Mexico City
Mexico

June 5, 1984

"This article was written during 1968, while I was establishing a new electron microscopy laboratory at the National Institute of Cardiology of Mexico. During my postgraduate training at the Cancer Research Institute at Villejuif, near Paris, France, I started, in 1965, working at the laboratory for electron microscopy headed by the late Wilhelm Bernhard. At that time, Bernhard's laboratory was steaming with new developments in the field of biological electron microscopy, including advanced techniques for autoradiography, immunocytochemistry, and cryomicrotomy.

"After completing an ultrastructural study of the replication of the oncogenic adenovirus 12, I started a project to analyze the structural modification of plasma membranes in cancer cells, both in solid tumors and in cell cultures. The finding of a striking deficiency in cell junctions in malignant cells[1,2] required only standard electron microscopic techniques. However, the study of the surface coats of tumor cells involved specialized cytochemical techniques, such as the ruthenium red method devised by Luft[3] and the phosphotungstic acid technique described by Rambourg.[4] With these techniques, we were able to demonstrate differences between normal and cancer cells in cultures, reported in this and other papers.[1,5]

"During the late 1960s, the information concerning the surface coat components of animal cells was sparse and dispersed among morphological, biochemical, and immunological reports. I felt the need for a critical review of the subject. The review was prepared back in my Mexico City laboratory. In retrospect, I think that some of the advantages that I had at that time, in order to complete what was going to become a relatively well cited article, were a peaceful setting, time to carefully review the literature and conduct my observations, and the lack of a deadline. These conditions are hardly found at present when experimentation, teaching, and the writing of grant proposals leave little spare time for thinking.

"The large number of reprint requests received—more than two thousand—indicated that timeliness was one of the possible assets of the article. As stated in the paper, the purpose was to critically review, in the light of my own experience, knowledge on the nature of cell surface layers of animal cells. After its publication in 1970, a bibliographic explosion in the field of surface components occurred, which continues even now. This subject, which 15 years ago could be covered in a single monograph, now requires several multiauthored series exclusively devoted to this important field of cell biology."

1. **Martínez-Palomo A, Brailovsky C & Bernhard W.** Ultrastructural modifications of the cell surface and intercellular contacts in some transformed cell strains. *Cancer Res.* 29:925-37, 1969. (Cited 135 times.)
2. **Martínez-Palomo A.** Ultrastructural modifications of intercellular junctions in some epithelial tumors. *Lab. Invest.* 22:605-14, 1970. (Cited 65 times.)
3. **Luft J H.** Fine structure of capillary and endocapillary layer as revealed by ruthenium red. *Fed. Proc.* 25:1773-83. 1966. (Cited 310 times.)
4. **Rambourg A.** An improved silver methenamine technique for the detection of periodic-acid reactive complex carbohydrates with the electron microscope. *J. Histochem. Cytochem.* 15:409-12. 1967. (Cited 200 times.)
5. **Martínez-Palomo A & Brailovsky C.** Surface layer in tumor cells transformed by Adeno-12 and SV40 viruses. *Virology* 34:379-82. 1968. (Cited 50 times.)