This Week's Citation Classic


AUGUST 30, 1982

This paper reported for the first time a method for isolating pure liver plasma membranes, accompanied by a comprehensive account of chemical, enzymatic, structural, and immunological properties of the isolated membranes. Marker enzymes were thus established. [The SC] indicates that this paper has been cited in over 695 publications since 1964."

"We then set out to find a suitable method for the isolation of plasma membranes from liver and liver tumors of rats and mice. In a number of pilot experiments carried out with fractionated liver homogenates subjected to electron microscopy, we observed that large plasma membranes preserving intact bile space membranes and being interconnected by junctional complexes—poorly known at the time and qualified as desmosomes and terminal bars—could be observed, mainly as cosediments in the nuclear fraction. It was decided to use these morphological criteria as provisional markers for the isolation of plasma membranes. Early in the course of our work, a paper by Neville describing the isolation of rat liver plasma membranes appeared. The data contained therein, plus our experience then, led to a procedure which was essentially a modification of Neville's method, specifically aiming at the removal of contaminating mitochondria. This method, which has sometimes been quoted as the Neville-Emmelot method, is the one featured in this Citation Classic, being our first full paper on the subject. An exhaustive description was provided later."

"From the outset our interest and effort were not so much directed toward the normal plasma membrane per se, as a void area for study, but rather to the elucidation of surface properties which might distinguish tumor from normal cells. The aim of a comparative analysis, however, necessitated a thorough study of the chemical, enzymatic, structural, and immunological properties of the liver plasma membrane of which the first results were contained in our 1964 paper. This and following papers have contributed to the field of fundamental membranology, besides helping to elucidate our primary aim."

"The reason that our 1964 paper has been quoted so often is, I think, due to the fact that it presented a body of diversified data—provided by my coauthors in a multidisciplinary approach—which allowed a good appreciation of the method. I also believe that the elaboration of these data and the new findings reported in our subsequent papers have focused attention on the original 1964 paper. Furthermore, I have heard either by letter or personal contact that the method was easily reproducible, also with respect to the quantitative data. Most important, however, I have been informed more than once that the paper has been an impetus for others to study a particular problem at the level of the isolated plasma membrane."

---