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A new take on the old

This new section is our way of celebrating 50 years of magnificent cell biology in the pages of the *Journal of Cell Biology*. It is, to a first approximation, chronological, but by necessity far from exhaustive. We consciously set out to sketch some high points in the history of the Journal, but not to cover the entirety of cell biology. Papers from other journals are, however, always cited when appropriate.

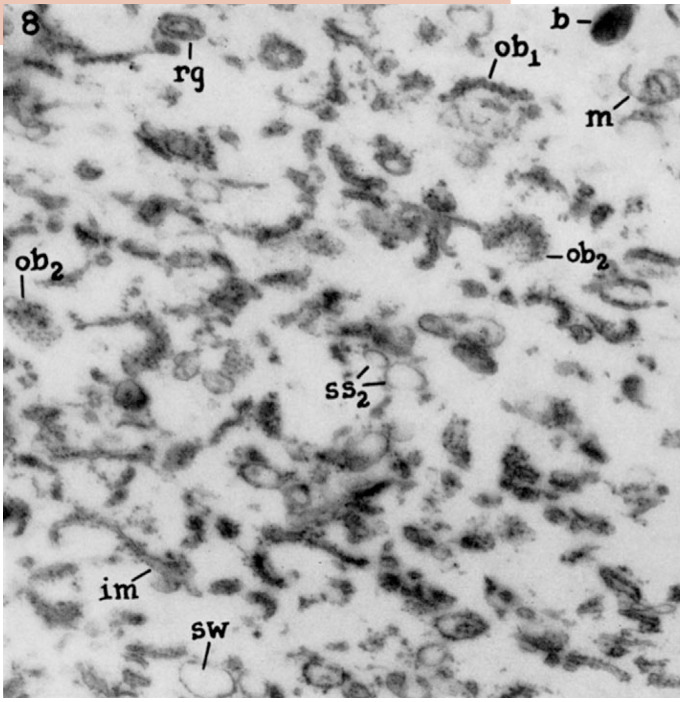
The selection of articles to be covered will always be a subjective process. We tried to improve these judgements by using multiple sources of information: older review articles, citation frequencies and, most importantly, the recommendations of past and present *JCB* editorial board members. Sincere thanks to all those who provided suggestions and helped with context and first-hand accounts of research—research that happened many years ago but that provides many salient lessons for cell biologists working today. Happy reading!

Microsomes are the in vitro ER

The abundance of electron microscope (EM) images in the 1940s and 1950s brought a new problem: nomenclature. What to call all those black smudges? As recalled by Palade (1956), "it appears that, at that time, our group was not yet engaged in large scale production of new cytological terms with a heavy Latin flavor, and was still proceeding with cautious restraint in matters of nomenclature." But there were plenty to take Palade's place.

Perhaps the first connection between two parts of this nomenclature came with a paper by Palade and Siekevitz (1956a). They united the fields of microscopy and fractionation to conclude that Albert Claude's biochemical fraction called microsomes (Claude, 1943) were none other than the in vitro version of the endoplasmic reticulum (ER)—a cytological feature first noted by Keith Porter (Porter, 1953).

Claude had stumbled upon microsomes when he was hunting for Rous sarcoma virus. His RNA-containing fraction was a promising place to find an RNA virus, but unfortunately an identical RNA-containing fraction could be isolated from uninfected cells. Numerous investigators later suggested that microsome fractions were linked to protein synthesis, as they were the first fractions to incorporate radioactive amino acids.



PALADE

Microsomes (here) and ER look similar, and both have ribosomes (see dots near "ob2").

Now, the problem was to find the in vivo correlate of microsomes. Although microsomes from rat liver cells were more fragmented than the original ER, the general structure of the membranous compartment stayed consistent throughout the fractionation. More tellingly, bound "dense particles" (now known as ribosomes) were a characteristic mark of both the in vivo and in vitro structures. The microsomes "could only have come from a fragmentation of the ER," says Siekevitz. "It was the only thing in the cell that they resembled." Detergent treatment then showed that the ribosomes were the RNA-rich components of the ER.

These findings were reproduced in pancreatic cells by Palade and Siekevitz (1956b), who made special note of "the frequent association of the small particles in chains and relatively large, more or less orderly organized masses." At least some of these patterns, and the "parallel double rows, loops, spirals, circles, and rosettes" noted in the original description of ribosomes by Palade (1955) were probably polysomes—a structure whose existence was not fully proven for another 6 years (Warner et al., 1962). During that period Palade had continued success in combining EM and fractionation, which contributed in no small part to his receiving the 1974 Nobel Prize in Physiology or Medicine along with Claude and Christian de Duve. JCB

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