

7.61 DISCUSSION D11: Secretory Pathway Discussion

Assigned Reading for Discussion #11, Wed December 6, 2006

As usual...

What are the main questions addressed?

How are they addressed?

How conclusive are the answers?

When discussing the figures, remember: **Goal, Approach/Method, Findings/Result, Conclusion, Comments**

PLEASE, don't forget to draw a CONCLUSION!

Ordering a pathway using cell fractionation and biochemistry:

1. **D. E Goldberg and S. Kornfeld "Evidence for extensive subcellular organization of asparagine-linked oligosaccharide processing and lysosomal enzyme phosphorylation" *J. Biol. Chem.* 258 (1983):3159-3165.**

One of the early studies which used cell fractionation and biochemical analysis to define the ordered organization of the processing of glycoproteins by the Golgi. Don't be thrown by the complex glycosyltransferase and glycosidase names in this paper. Refer back to either Alberts et al or Lodish et al or the class notes if you want some help with the glycosylation. A genetic approach to the problem, and a classic in the field is: P. Novick, S. Ferro and R. Schekman "Order of events in the yeast secretory pathway" *Cell* 25: 461-469 (1981). Use of yeast genetics to define critical genes and order the secretory pathway.

Cell free assay of membrane vesicular trafficking

2. **J. Ostermann, L. Orci, K. Tani, M. Amherdt, M. Ravazzola, Z. Elazar, and J. E. Rothman "Stepwise assembly of functionally active transport vesicles" *Cell* 75: 1015-1025 (1993).** An example of what a relatively simple in vitro assay can lead to in dissecting a complex pathway. Also see: E. Fries and J. E. Rothman "Transport of vesicular stomatitis virus glycoprotein in a cell-free extract" *Proc. Natl. Acad. Sci. USA* 77: 3870-3874 (1980). This was the beginning of the use of cell-free membrane transport assays for the biochemical analysis of membrane transport.