This study used light and electron microscope radioautography to document the addition of radioactive residues to glycoproteins in the Golgi apparatus in virtually all cell types. These molecules were seen to migrate to lysosomes, secretary processes, and especially the cell surface where they contributed to the "cell coat" of the plasma membrane. (The SCI® indicates that this paper has been cited in over 310 publications.)

Golgi Apparatus Production of Cell Surface Glycoproteins
Gary Bennett
Department of Anatomy
McGill University
Montreal, Quebec H3A 2B2
Canada
July 28, 1989

For my part the present work represented the culmination of several years of graduate studies during which I was privileged to work under the supervision of Dr. Charles Philippe Leblond at McGill University. I had joined Leblond's laboratory in 1965, just in time to receive some supervision from Marjan Neutra and to witness the publication of Neutra and Leblond's landmark paper on the uptake of H-glucose label in the Golgi apparatus of intestinal goblet cells—the first dynamic labeling to be seen in the plasma membrane.

Neutra and Leblond had also provided light microscope evidence for the migration of glycoproteins from the Golgi complex to the plasma membrane of intestinal columnar cells. Plasma membranes had been studied biochemically in only a few cell types at this time, but evidence for the presence of carbohydrate at the surface of all cells had been provided by Leblond's laboratory in the form of histochemical studies using the periodic acid-Schiff or colloidal iron techniques.

During the 1960s many common sugars became commercially available in tritiated form, and each was used for radioautographic investigation by me and others in Leblond's laboratory. The introduction of 3H-fucose was a great advance, since this highly specific label was incorporated exclusively into fucose residues of glycoconjugate side chains.

2. Bennett G & Leblond C P. Formation of cell coat material for the whole surface of columnar cells in the rat small intestine, as visualized by radioautography with 3H-fucose-6-4. J. Cell Biol. 66:89-95, 1975. (Cited 200 times.)
5. Bennett G O'Shaughnessy D. The size of incorporation of sialic acid residues into glycoproteins and the subsequent fates of these molecules in various rat and mouse cell types as shown by radioautography after injection of 3H-N-acetylglucosamine. J. Histochem. Cytochem. 38:11-15, 1981. (Cited 65 times.)