

# Presentation of the 2003 A.N. Richards Award to Marilyn Farquhar

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Fig. 1. Marilyn Farquhar

It is a great pleasure and honor for me to say a few words of appreciation for Dr. Marilyn Farquhar (Fig. 1). Dr. Farquhar is being awarded the A.N. Richards Award of the ISN for the many scientific contributions of the highest quality that have streamed out of her laboratory for several decades.

Some of her contributions have become common knowledge to the extent that they are found in all relevant textbooks, however, without any quotation of the originator (i.e., the most honorable facet of forgetfulness in science). A few examples include the following. Everybody takes it for granted that pathologically enhanced glomerular permeability is associated with flattening of foot processes of podocytes. Few people are aware of the fact that, in a landmark paper in 1956, Dr. Farquhar was among the first to use electron microscopy to look at renal biopsies of humans, and, at this occasion, discovered this phenomenon [1] that has only been slowly unravelled on a molecular basis in the last years. This work was performed in the laboratory of Dr. Robert Vernier in Minneapolis, where she arrived from the University of San Francisco,

after she received her Ph.D. in Pathology. The Minneapolis laboratory was arguably a cradle of modern investigative nephrology, which unified clinical observation with leading-edge science to unravel the pathogenesis of renal diseases. Another equally important contribution was the finding that immune deposits are actually located in the basement membrane in specific areas, in particular in membranous nephropathy within the lamina rara externa right under the foot processes [2]. Dr. Farquhar's productivity was even more stimulated when she moved on to Dr. George Palade's laboratory at Rockefeller University. Some selected seminal contributions she contributed during this time include the following limited examples. The first use of ferritin as a tracer for electron microscopy demonstrated that "the third cell type of the glomerulus," known today as the mesangial cell, is able to endocytose material from the circulation [3]. In a different study, Dr. Farquhar discovered that cell membranes of podocytes form "kisses" between flattened foot processes in rat puromycin nephrosis that had lost or dislocated their slit diaphragms. This was actually the first observation of tight junctions and gave rise to a classic paper, together with George Palade, on the ubiquity of tight junctions and other cellular contacts as common building blocks of every epithelial cell [4]. Another series of investigations focused on the localization of the filtration barrier within the glomerulus. A fierce competition with the laboratory of Morris Karnovsky at Harvard, who initially proposed the slit diaphragm as ultimate glomerular filtration barrier, converged eventually on the glomerular basement membrane as the major filtration barrier, and here in particular to the lamina rara interna for albumin, IgG, and dextran [5]. As a "byproduct," immunoelectron microscopy was developed to a still unsurpassed quality and reliability that makes the results obtained in these experiments not obsolete at all, although little reference is made in these days in a current remake of this conflict.

However, it would be an incomplete list of the contributions of Dr. Farquhar to the field of investigative nephrology, if only past merits are cited. A look into the most recent list of publications clearly shows that this stream of high-quality contributions has never stopped, neither in the field of nephrology, nor in that of basic cell biology, in particular, aspects concerning vesicular transport and the Golgi apparatus [6]. In glomerular biology, the contributions centered around intracellular signaling and con-

nections of podocyte membrane proteins, such as podocalyxin and megalin [7, 8].

It is likely that these achievements were facilitated by the embedding into a unique scientific “family,” with George Palade in the center, and many of his associates, who are also colleagues and friends to Dr. Farquhar. Pars pro toto, I only mention Dr. Günter Blobel, who will give a lecture later at this meeting. This “family” also continued after Dr. Marilyn Farquhar and George Palade moved to the University of California in San Diego, where she is currently Professor and coordinator of the Department of Cellular and Molecular Medicine.

It is truly amazing that Dr. Farquhar found time, in addition to all these professional loads, for her “biological family” and, in particular, for her grandchildren.

In many of us who had the opportunity to receive training in Dr. Farquhar’s laboratory as post-doctoral fellows or visitors from abroad, this time has left permanent marks in our way of thinking and in the quality standards of our scientific work.

Finally, several parties should be congratulated. First, Dr. Farquhar should be congratulated for receiving the A.N. Richards Award of the ISN. Second, the Society

and the scientific community should be congratulated for honoring a person of such talents as Dr. Marilyn Farquhar who has devoted a major part of her energy to the field of investigative nephrology.

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