
Modeling a Scientific Career: An Essential Component of the Mentorship Process

An Interview with John A. Williams, Professor of Molecular and Integrative Physiology, University of Michigan, Ann Arbor, Mich., USA

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Abstract

In the current interview article, Dr. John A. Williams shares his experiences, and provides career advice to junior investigators. Dr. Williams is one of the world's leading physiologists working on signal transduction mechanisms in pancreatic acinar cells. He is worldwide recognized for his contribution to many areas of pancreatology, especially the understanding of GI hormone regulation of pancreatic exocrine function.

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M.E.F.-Z.: What led you to work in pancreas research in the first place?

J.A.W.: It was a rather unusual path filled with serendipity as one finds in many scientific investigations. Having grown up in a small college town in Washington state with an interest in science and natural history I aimed towards a career in medicine, in part because I received a lot of social reinforcement when I mentioned it. After 3 years in college and having spent the previous summers stacking hay and sweeping corn husks on the floor of a food processing plant, I jumped at the chance to enter a summer research program prior to starting medical school at the University of Washington. By a somewhat



Dr. John A. Williams

convoluted logic I was placed in an electrophysiology laboratory and proceeded to fall in love with laboratory research. I enjoyed both the hands on part including pulling microelectrodes and the rigorous logic of explaining electrical potentials in cells. I then took a year off to do research in the middle of medical school after which my mentor, J. Walter Woodbury asked me if I wanted to take another year off and earn a PhD. My thesis was on the electrophysiology of the thyroid. Upon graduating, I disappointed some of the School of Medicine faculty by choosing to do research as a postdoctoral fellow rather than a medical internship at a prestigious Boston hospital. I did a 2-year stint in the U.S. Public Health Service at NIH to fulfill my military obligation where I carried out research on thyroid secretion with Jan Woolf. We then moved to Cambridge in the UK where I worked in the laboratory of Keith Mathews. There, I worked adjacent to another postdoc, Ole Petersen, who had come from Copenhagen and was recording intracellularly from pancreas while I made electrical recording from brown fat. It became apparent to me that the exocrine pancreas was an ideal tissue with which to study regulated secretion in that it was homogeneous with one predominant cell type and that there were simple assays to measure the enzymatic activity of the secretory products. We carried out a still cited study showing the release of intracellular calcium and its relationship to secretion in perfused pancreatic segments stimulated with CCK-PZ. After an enjoyable stay in Cambridge, which included much traveling to see ancient cathedrals and castles, we moved to San Francisco where a faculty position was waiting. Over the first 5 years there, my research work shifted almost entirely to the pancreas and I switched from considering myself an endocrinologist to being a cellular GI physiologist. I was able to bridge these interests by studying the effects of insulin on acinar cells and the action of gastrointestinal hormones especially CCK on the exocrine pancreas. This was part of a fruitful collaboration with Ira Golfine who studies insulin action. My interest in the pancreas has continued to today after a transplant to Michigan and has broadened to include many aspects of physiology and pathophysiology.

M.E.F.-Z.: You have pioneered pancreas research in so many directions. At the end of the day, what has given you the most personal satisfaction?

J.A.W.: This would probably depend on which day this was asked. I find the most exhilarating part of research is the process of generating an idea to test because you are making intellectual jumps that consume your thinking. Finishing the research and publishing the results is also

satisfying but sometimes is more a feeling of relief. What gives me the most satisfaction, however, is working with the young scientists and physicians in the laboratory, seeing them develop, and in many cases initiating lifelong friendships that are renewed at meetings and through travel around the world. At some points, the annual meeting of the American Pancreas Association almost seems like a laboratory reunion. I am on purpose not detailing names of those who worked in my laboratory as it would be impossible to mention everyone.

M.E.F.-Z.: Based on your experience as mentee and mentor, can you comment on the value of mentorship for the development of new investigators?

J.A.W.: To me, the most important part of mentorship is modeling how to carry out scientific investigation, to be a committed teacher, and to be a forward thinking leader when given the opportunity. Almost all of my early mentors were 'hands on' scientists. We rarely had formal discussions of career issues but I learned from them to work hard but carefully, to hold high standards, and to be an effective communicator. This was of course before mentorship was fashionable. Later, when I became a faculty member I had certain individuals I considered role models including my Chairman at UCSF, Fran Ganong. Today, mentorship has become institutionalized but my personal style is still to carry it informally. Most often this takes place in the laboratory. One of my favorite settings has been to take lab members to a scientific meeting, often to share a meal, and at the end of the day discuss what we learned and how it might impact our research.

M.E.F.-Z.: What is the best advice you have received during your career?

J.A.W.: I am not really sure what the best advice I have received was, but it probably came from my wife, Christa.

M.E.F.-Z.: What is your advice to young investigators that are beginning in the field of pancreas research?

J.A.W.: To young investigators beginning in the field of pancreas research my advice is to pick a subject to investigate which is intrinsically important, that you find interesting, and that you can carry out with the resources available to you. Then stay focused on this area until you have generated a reputation, received grants and published papers. Once you have done this if you are in academia, you will get promoted or receive tenure and then other opportunities will open for you.

M.E.F.-Z.: What do you think are the big questions that need to be answered in pancreatology?

J.A.W.: The areas that need answers in order to understand pancreatic function include completing the reductionist approach to categorizing the parts (molecules) in the cellular machines along with understanding how these parts work together as a system. This will then allow understanding of how the parts and the system are altered in diseases such as pancreatitis, pancreatic cancer and cystic fibrosis. Finally, how are the components and the system affected by the environment, especially how nutrients and other dietary components and toxins such as tobacco smoke contribute to disease process.

M.E.F.-Z.: What do you think is the major need that a journal like *Pancreatology* should fill?

J.A.W.: A journal devoted to the pancreas allows presentation of results that are of interest to the pancreatic specialist. While publication in general interest and high impact journals are desirable for some articles, the role of the subspecialty journal is to be a repository of data and to be a community billboard. To be attractive to investigators, it needs to provide rapid and fair reviewing that helps authors with clarity in their scientific communications. This latter point is especially important for an international journal soliciting contributions from around the world.