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## 'Good Mentorship Is Invaluable' – An Interview with Dr. Eugene P. DiMagno

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### Abstract

Dr. DiMagno is internationally renowned for his contributions to almost all areas of pancreatology. He helped pioneer discoveries about normal pancreatic function, enzyme-based treatment of exocrine pancreatic insufficiency as well as methods of diagnosing pancreatitis and pancreatic cancer, including the development of function tests and endoscopic ultrasound. Answering Martin Fernandez-Zapico's questions, he stresses the importance of good mentorship and gives us a glimpse of his life and work.

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

**E.D.:** My interest in the pancreas first was instilled by Prof. Harry Lane, who was a Professor of Biology and Embryology at Franklin and Marshall College in Lancaster, Pa., USA. He had a small research program in embryology and was mostly interested in limb development. He had found that sulfonylureas injected into the circulation of chick embryos produced limb deformities and wondered if altered glucose metabolism in the embryos was responsible for these findings. I became a student of Prof. Lane's during my junior year when I took his class in Embryology and Anatomy, a required class for premedical students. Toward the end of the academic year, Prof. Lane asked a very good childhood friend and classmate, Robert G. Tancredi (later a medical student with me at the University of Pennsylvania and a colleague



as a Mayo Clinic Cardiologist) and me if we wanted to participate in a research study. This offer was considered a plum and we jumped at the chance. The basic design of the study was to inject either carbutamide or tolbutamide into the chick egg embryo at various times of the 21-day incubation period and to obtain blood from the embryonic blood vessels and measure blood sugar. The experimental design was simple but, as with most research pro-

jects, it was necessary to overcome a number of problems, e.g. to learn to candle the eggs to locate the embryo and blood vessels, to use the appropriate aseptic technique to inject the drug, and to obtain blood samples from the tiny embryonic vessels to measure blood sugar. This experience was invaluable and taught me the value of experimental design and the necessity of hard work to achieve the aims of a study. The eventual outcome of this work was the publication of a senior honor thesis and graduation from Franklin and Marshall College with honors in Biology.

Following medical school I was an intern at Lancaster General Hospital, during this internship I wrote and published a case report on Sheehan's syndrome but until my gastroenterology fellowship at Mayo I did no further research. The fellowship at that time was a 2-year program and it was required that the trainees do research throughout the 2 years. The 1st year the trainee did all the work and during the 2nd year usually a technician would help with the project(s). For 6 months during the 2nd year the trainee would have clinical responsibilities to learn clinical gastroenterology. However, research and clinical training were closely mentored.

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

**E.D.:** There is a twofold answer: personal and scientific satisfaction. The greatest personal satisfaction in research was the personal relationships I developed with my colleagues: first with my mentors, then with clinical and scientific colleagues and later with the fellows in my laboratory. These friendships with colleagues from many cultures and countries are very precious, enduring and continue to broaden my outlook beyond very parochial viewpoints, an outlook that is sorely lacking in today's world.

The greatest scientific satisfaction has been to ask what I considered significant clinical questions and then go to the laboratory to try and answer them. Treatment of exocrine pancreatic insufficiency based on physiologic studies on the capacity of pancreatic enzyme secretion and fate of pancreatic enzymes in the gastrointestinal tract, and the diagnosis of pancreatitis and pancreatic cancer, including the development of pancreatic function tests and endoscopic ultrasonography, are some of the areas I investigated, all with a focus on the exocrine pancreas.

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

**E.D.:** It is invaluable. I was fortunate to have a series of mentors in college and in my clinical and research careers that were very interested in me and were always encouraging, supportive and willing to give sound advice and direction. This is a model I endeavored to follow.

**M.F.-Z.:** What advice can you give to young investigators starting in the field of pancreas research?

**E.D.:** The advice I would give to young investigators is: FOCUS, FOCUS, FOCUS!!! In the research area, Dr. Summerskill delivered this advice to me time and time again, and it was reinforced by other investigators in the Gastroenterology Research Unit (Mayo Clinic) at that time (Sid Phillips, Alan Hoffman, Les Schoenfield and Bill Balsus). In the clinic this advice was also given by Dr. William Sauer, the head of the gastroenterology section I joined, and by Dr. Charles Moertel, a renowned and gifted clinical scientist in oncology who initiated the Division of Oncology at Mayo and was a member of that section at the time I joined the Sauer section. I, like most investigators I know, was very inquisitive and I had many questions I wanted to investigate. If this course is pursued the great danger is that the young investigator will become diffuse (a favorite term of Dr. Summerskill) and never become an expert in one area. All my mentors argued that to make a significant contribution to medicine one must focus on a particular area and develop all energies to solve the *important* questions.

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

**E.D.:** As a clinician scientist, I believe the important problems continue to be how to prevent and if present how to best diagnose and cure diseases of the exocrine pancreas. We have made great strides in understanding risk factors, including environmental and genetic ones, that are important causes of pancreatic diseases, but we have only scratched the surface and still have an incomplete understanding of how to apply this information to prevent pancreatic disease. Similarly, in the past 4 decades there has been a revolution in the diagnosis of pancreatic disease. For example, when I became a gastroenterologist/pancreatologist in 1970, the only imaging tests widely available were the plain abdominal X-ray and barium studies. Despite the wide range of current imaging tests, there is, however, still a major problem to diagnose early chronic pancreatitis and pancreatic cancer. The solution may not be more imaging tests, but in applying new or yet to be discovered very early (biochemical or genetic) markers in blood and/or pancreatic secretions. The fewest gains have been made in the treatment of diseases of the pancreas. To continue progress we must

promote basic and translational research to better understand the cellular mechanisms of the normal and diseased pancreas and then bring these findings to the bedside to prevent, diagnose and eventually cure pancreatic disease.

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

**E.D.:** *Pancreatology* must do two things: it should offer a real incentive for serious scientists to submit good quality articles (very rapid review and publication) in order to increase the impact factor, providing a platform for experts in the field, and it must fill a need other than to publish original articles, e.g. an educational mission to

both basic scientists doing research in the exocrine pancreas and to clinicians, as well as a section devoted to great experiments in pancreatology. Thus, one could envision three features in each issue: an educational primer in basic sciences, an educational primer in clinical pancreatology and, lastly, a historical article or vignette with the objective of highlighting an important discovery or experiment in pancreatology (either basic or clinical).

**M.F.-Z.:** Dr. DiMagno, thank you very much for this stimulating conversation.

Martin Fernandez-Zapico is a Scientific Editorial Assistant of *Pancreatology*.