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SER MÉDICO

... as a Physician and Professor at the University of Chicago

Ser médico... como médico y profesor de la Universidad de Chicago



Introduction

I look back on a nearly 50-year career in academic medicine with pleasure and humility. During this period, I have been fortunate that my work environments have consistently provided me with opportunities to witness and contribute to remarkable advances in the knowledge of human biology and medicine and to sustain my commitments to caring for and learning from patients and to teaching a new generation of physicians and physician-scientists. I must acknowledge that fulfillment of my intellectual and humanistic needs over the years has been greatly enhanced by supportive and mutually respectful relationships with family members, mentors, students, medical and scientific colleagues, and patients, both in my years of training and, for the past 30 years, in my work at The University of Chicago ("Chicago").

My training

When I began my studies at the University of Pennsylvania, I was already considering a career in medicine, almost certainly because I had grown up observing my physician father's compassion and commitment to his patients. The idea of becoming a physician was further strengthened, however, by studying a curriculum, traditional in the early years of American undergraduate education, emphasizing acquisition of fundamental knowledge in many areas of liberal arts and sciences rather than focusing early on mastery of a single major area of study. I believe that exposure to the breadth of human experience and to the diverse means by which knowledge is achieved influenced me even more than the impressive growth of molecular technology to recognize the potential for improving the quality of human life and for creating new knowledge.

In my later undergraduate and medical school years (also at Pennsylvania), I worked with a series of research and clinical mentors who were role models in providing me the encouragement and increasing independence that led me to seek proficiency in patient care and to identify research interests I might later pursue. I learned from these physicians and scientists how respectful interaction with others, whether patients, students and laboratory staff colleagues, clinicians, or basic scientists promotes cooperation, enhances trust, and accelerates the acquisition of knowledge. I found working with patients to be attractive and fulfilling, and I particularly enjoyed the thoroughness, emphasis on long term doctor-patient relationships, and emerging investigative opportunities available in Internal Medicine. I came to realize that even if my future training and research activities might limit my clinical work for substantial periods, I would never willingly relinquish patient care as a substantial part of my professional life. This was a view strengthened during my Internal

Medicine residency years at Washington University in St. Louis.

Because by the 1960s and 1970s molecular biology and genetics had emerged as increasingly sophisticated fields of study clearly applicable to advancing an understanding of human disease, I sought to expand my knowledge in these disciplines. With the support of medical school and residency mentors, I was appointed as a Research Associate in the laboratory of Dr. Gordon Tomkins at the National Institutes of Health (NIH) in Bethesda, Maryland. With the solid support of an intensely intellectual group of colleagues, I initiated studies on the biochemical and genetic regulation of metabolic pathways that I was to apply to one or another specific clinical problem for the next 35 years.

During a post-doctoral fellowship with Drs. J.E. Seegmiller and Nathan J. Zvaifler at the University of California, San Diego (UCSD), I acquired clinical training in Rheumatology and the background in biochemistry and cell biology necessary for me to undertake my most productive independent research, defining molecular mechanisms by which human purine and pyrimidine nucleotide metabolic pathways are regulated under normal conditions or conditions altered by genetic or pharmacological influences. I then joined the faculty of the Department of Internal Medicine at UCSD for 8 productive and exciting years as a clinician/investigator. In light of the fact that it is the major clinical disorder of purine metabolism, gout became my specific clinical area of expertise within the subspecialty of Rheumatology.

While studying the role of purine synthesis in the stimulation of cell growth by growth-promoting proteins and small molecule effectors as a Guggenheim Foundation Fellow in the laboratory of Dr. Enrique Rozengurt at the Imperial Cancer Research Foundation, London, U.K., I was offered the opportunity to move to the University of Chicago. Although I knew that Chicago occupies an esteemed place in the world of higher education in America, I knew little about the institution and set out to discover more.

The University of Chicago

Throughout the 120 years of its existence, Chicago has been true to its founding precept: ... *“to advance and to create knowledge for the enrichment of human life”*. In 2011, Chicago was named one of the top 10 universities in overall academic excellence in the Academic Ranking of World Universities. Eighty-seven Nobel Prize laureates, including 12 whose awards were in the biomedical sciences, have been affiliated with the University (Table 1). Chicago is a private research University located in the Hyde Park community (Fig. 1) on the South Side of this city of 3 million persons, (Fig. 2) contained within a metropolitan area of 7 million. Of the overall student population of 15,000 at Chicago, approximately 5000 are undergraduates in the College of Arts and Sciences and the rest are pursuing degrees in graduate programs or interdisciplinary committees organized into 4 Divisions: Humanities, Social Sciences, Physical Sciences, and Biological Sciences. Among 6 professional schools, the Pritzker School of Medicine (approximately 450 students) is a component of the Biological Sciences Division.

Table 1 Nobel laureates affiliated with the University of Chicago.

Chemistry

- Ada E. Yonath, 2009
- Irwin Rose, 2004^a
- Richard E. Smalley, 1996
- F. Sherwood Rowland, 1995^a
- Paul Crutzen, 1995
- Yuan T. Lee, 1986
- Henry Taube, 1983
- Herbert C. Brown, 1979^a
- Ilya Prigogine, 1977
- William H. Stein, 1972
- Gerhard Herzberg, 1971
- Robert S. Mulliken, 1966^a
- Karl Ziegler, 1963
- Willard Frank Libby, 1960
- Glenn Theodore Seaborg, 1951
- Harold Clayton Urey, 1934

Economic Sciences

- Thomas J. Sargent, 2011
- Roger B. Myerson, 2007^b
- Leonid Hurwicz, 2007
- Edward C. Prescott, 2004
- James J. Heckman, 2000^b
- Daniel L. McFadden, 2000
- Robert A. Mundell, 1999
- Myron S. Scholes, 1997^a
- Robert E. Lucas Jr., 1995^{a,b}
- Robert W. Fogel, 1993^b
- Gary S. Becker, 1992^{a,b}
- Ronald H. Coase, 1991^b
- Merton H. Miller, 1990
- Harry M. Markowitz, 1990^a
- Trygve Haavelmo, 1989
- James M. Buchanan Jr., 1986^a
- Gerard Debreu, 1983
- George J. Stigler, 1982^a
- Lawrence R. Klein, 1980
- Theodore W. Schultz, 1979
- Herbert A. Simon, 1978^a
- Milton Friedman, 1976^a
- Tjalling C. Koopmans, 1975
- Friedrich August von Hayek, 1974
- Kenneth J. Arrow, 1972
- Paul A. Samuelson, 1970^a

Literature

- John M. Coetzee, 2003
- Saul Bellow, 1976^a
- Bertrand Russell, 1950

Peace

- Barack Obama, 2009

Physics

- George E. Smith, 2009^a
- Yoichiro Nambu, 2008^b
- Frank Wilczek, 2004^a
- Alexei A. Abrikosov, 2003
- Masatoshi Koshiya, 2002

Table 1 (Continued)

- Daniel C. Tsui, 1998^a
- Jerome I. Friedman, 1990^a
- Jack Steinberger, 1988^a
- Leon M. Lederman, 1988
- Subrahmanyam Chandrasekhar, 1983
- James W. Cronin, 1980^{a,b}
- J. Robert Schrieffer, 1972
- Murray Gell-Mann, 1969
- Luis W. Alvarez, 1968^a
- Hans Albrecht Bethe, 1967
- Julian Schwinger, 1965
- Eugene P. Wigner, 1963
- Maria Goeppert-Mayer, 1963
- Owen Chamberlain, 1959^a
- Chen Ning Yang, 1957^a
- Tsung-Dao Lee, 1957^a
- Ernest Orlando Lawrence, 1939^a
- Enrico Fermi, 1938
- Clinton Joseph Davison, 1937^a
- Werner Heisenberg, 1932
- Arthur Holly Compton, 1927
- James Franck, 1925
- Robert Andrews Millikan, 1923^a
- Albert Abraham Michelson, 1907

Physiology or Medicine

- Bruce A. Beutler, 2011^a
- Roger W. Sperry, 1981^a
- George Wald, 1967
- Charles Brenton Huggins, 1966
- Konrad Bloch, 1964
- Sir John Carew Eccles, 1963
- James Dewey Watson, 1962^a
- Edward Lawrie Tatum, 1958^a
- George Wells Beadle, 1958
- Hermann Joseph Muller, 1946
- Edward Adelbert Doisy, 1943
- Alexis Carrel, 1912

^a University of Chicago alumnus.^b Current member of faculty.

Figure 1 The University of Chicago in fall, viewed from the midway plaisance.

The University of Chicago Medical Center is located on the main Hyde Park campus and serves as full-service inpatient and outpatient medical institution with residency and fellowship programs in all medical disciplines. The proximity of the medical and biological sciences programs to the additional resources of the university has promoted an atmosphere of considerable intellectual intensity and collegiality. This environment has played an important role in the development of the many innovative programs for which Chicago is known: in the humanities and social thought (social services, ethics, religion, literature, anthropology, and economics); in the physical sciences (nuclear, particle, and astrophysics); and in the biological sciences (cellular biology and hormone receptor physiology, diabetes and metabolic disease, cancer cytogenetics and therapy, cellular immunology, and gastrointestinal physiology and therapeutics).

As might be expected from the above description, when I was invited to join the faculty at Chicago in 1980, I was gratified, and I have not been disappointed in my ultimate decision to accept the position offered. (Although when asked many times over the years why I would leave La Jolla, California and its 300+ days per year of sunshine for frigid Chicago, I have often responded in my most serious manner "...for the weather!").

Lessons learned at Chicago

Early in my career at Chicago, the physician side of my physician-scientist duality was delighted to discover that despite its strong scientific atmosphere, the university was not "an ivory tower" in which the practice of medicine was relegated to a role secondary to laboratory research. In fact, contrary to what I had seen at other institutions, patient care and clinical teaching of students and residents were the domains of the physicians and physician-investigators in all divisions of the Department of Medicine. This unusual approach to academic medical care reflected a characteristic of the department that had been in place since the inception of the Medical School in the 1920s. That is, all faculty members were full-time university appointees who accepted their positions at Chicago with the understanding that patient care was as much an integral part of the study of human biology as the investigations they wished to do. In this setting, General Internal Medicine, although a division of the department, denoted a group of Internists whose clinical efforts were broader than those of their colleagues in subspecialty divisions but who also pursued investigation (such as medical ethics, outcomes research, and epidemiology) that in many cases did not easily fit in a subspecialty framework. There was, then, no functional distinction between clinicians and investigators, because nearly all faculty members were committed to excellence in both activities. In the resulting educational program, medical students and resident physicians learned Internal Medicine as part of assigned rotations through primary care and subspecialty clinics or hospital wards supervised by the respective divisions, and the result was an unusually extensive and close network of relationships between students and residents on the one hand and faculty members, regardless of specialty, on the other. This arrangement also promoted retention among



Figure 2 The University of Chicago in the foreground, with the Chicago skyline and lake Michigan in the background.

most subspecialty faculty members of considerable interest and fund of knowledge in the broader range of Internal Medicine as well as in the respective subspecialty area.

Modifications of this unusual and educationally efficient system have taken place over the last 30 years, largely because of the explosion of both specialty and subspecialty knowledge and as consequences of insurer payment provisions. Nevertheless, under the enlightened leadership of Department Chairmen such as Dr. Arthur Rubenstein and Dr. Joe Garcia, Internal Medicine at Chicago has retained its commitment to the personalization of patient care and the willingness to experiment with social and administrative initiatives likely to promote closer and more lasting physician–patient–student interaction.

I was also initially concerned on arriving at Chicago that developing and staffing my laboratory to continue my research program would take substantial time. In the meanwhile, I turned my attention to developing a Rheumatology practice that would span the range of patients typical of the Rheumatology subspecialty but would also reflect my interest in gout and in clinical trials aimed at studying this disease. In the event, I was surprised at the assistance I received from my faculty colleagues, the Department of

Medicine, and the University administration as a result of which my laboratory was up and running in a very short time and continued to be productive and well supported for over 20 years. This experience typified the pleasures of working in a cooperative atmosphere, one that has been sustained throughout my years at Chicago. As a result of my many years at the institution, I have also experienced one of the true bonuses that Rheumatology affords: long-term patient–doctor relationships; many of my patients and I have known each other for 20 years or more, and I continue to treasure their visits and the friendships that have developed over so many years.

From 1981 to 2000, I was the Director of the Rheumatology Division, and although administration was not my favorite activity, I was gratified to watch and actively assist faculty members and fellows develop their careers. Overall, Rheumatology at Chicago became very well known for its clinical and teaching programs and, in recent years, under my successor, Dr. Marcus Clark, has established a nationally competitive research program in basic immunology and autoimmunity.

By the early 2000s, I concluded that it was time to do something different in my career, and I chose to undertake more extensive patient care and clinical research efforts. This change in emphasis has proved to be both exciting and enlightening to me. I have re-learned the lesson that caring for patients and supervising clinical/translational studies are in many ways more difficult than bench research but are, at least, equally rewarding. My efforts have been largely focused around gout, and, fortuitously, correspond in time to an enormous re-birth of interest in gout and its pharmacological and biological management. As a result, in my current status as an emeritus faculty member at Chicago, I have had the opportunity, as a valedictory to my career studying gout, to assist in the development of several new treatment agents that I am optimistic will provide the basis for more successful treatment of the entire spectrum of persons with this ancient but always interesting disease.

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