



History of Dermatology

Barbara A. Gilchrest: A world-renowned dermatologist and researcher, a great mentor, an educator, former president of the Society for Investigative Dermatology, editor-in-chief of *The Journal of Investigative Dermatology*, and a devoted friend

How can I even begin to illustrate, in a short article, a woman like Barbara Gilchrest? She has influenced my life for over 34 years in multiple ways, always being there for me and for others. Dr. Gilchrest encompasses many essential qualities that contributed to her superiority as a dermatologist, scientist, administrator, mentor, and friend, but the ones that most affected me were her creativity, enthusiasm, optimism, and endless support.

Just summarizing her accomplishments does not provide the reader with an accurate depiction of Barbara; nevertheless, it illustrates the achievements of a woman who has excelled in a field that was, for many years, dominated exclusively by men (Figs. 1–7).

Barbara received her bachelor's degree in mathematics from the Massachusetts Institute of Technology (MIT) in 1967 and graduated *cum laude* from Harvard Medical School in 1971. She completed 2 years of clinical training in internal medicine and 3 years of dermatology residency, including a 1-year photobiology fellowship with Drs. Thomas Fitzpatrick and John Parrish, in the Harvard-affiliated hospitals. She concluded her training with a laboratory-based research fellowship at MIT with Dr. Howard Green.

In 1977, Dr. Gilchrest joined the Department of Dermatology and Division on Aging at Harvard Medical School, where with support from the National Institute on Aging, she established a tissue culture laboratory to study aging and photoaging in human skin. During these early stages in her career, Barbara focused her interest in the fields of cutaneous aging and phototherapy and published seminal articles on these topics in the *New England Journal of Medicine* and the *Journal of Investigative Dermatology*. In addition to her contributions to these fields, she has pursued a basic science research career and was the first to develop a serum-free cultivation system for growth of human keratinocytes, work that was published in 1981 in the prestigious journal *Science* and has since been used by many laboratories throughout the United States and abroad to grow keratinocytes in controlled culture conditions.

In 1983, Dr. Gilchrest joined the USDA Human Nutrition Research Center on Aging at Tufts University as Chief of the Cutaneous Gerontology Laboratory and continued to expand her work on skin aging/photoaging and keratinocyte and melanocyte biology. She developed a unique, well-defined physiologic culture system to grow the fastidious cutaneous melanocytes. She and I, working with students and fellows, were among the pioneering investigators to demonstrate that keratinocytes produce cytokines—specifically,

interferon-like cytokine (published in 1986 in the *Journal of Cell Biology*)—and thus have an important role in mediating inflammatory and immune responses in the skin. We also continued to expand her work on melanocyte biology, proving that melanocytes express several receptors also expressed by neurons and that they respond to cytokines in a similar way to neurons (published in 1988 in the *Proceedings of the National Academy of Sciences*; 1991, *Journal of Cell Biology*; and 1994, *Journal of Clinical Investigation*), thus establishing melanocytes as a model system for the central nervous system.

In 1985, Dr. Gilchrest was appointed Professor and Chairman of Dermatology at the Boston University School of Medicine and Dermatologist-in-Chief at Boston Medical Center, where her clinical practice focused on laser therapy and prevention of skin cancers through sun avoidance and retinoid and photodynamic therapy of severely sun-damaged skin. Under her guidance, the dermatology department flourished and expanded to include a Dermatopathology section under the directorship of Dr. Jag Bhawan (see the following); melanoma and CTCL intervention section lead by Dr. Howard Koh, and later by the late Dr. Marie-France Demierre; a clinical research unit operated by Dr. Tania Phillips (see the following), which included wound-healing transitional and basic research with active the involvement of Dr. Hee Young Park (see the following); a busy cutaneous surgery unit and laser section; and a phototherapy unit supervised by Dr. Thomas Ruenger (see the following), whom she had recruited from his native country, Germany.

As successful as Dr. Gilchrest was in clinical dermatology, I believe that her passion was laboratory-based research. Her research interests were broad and involved cellular responses to ultraviolet (UV) irradiation; the molecular basis of aging; melanogenesis (pigmentation), particularly UV-induced melanogenesis or tanning; and DNA damage responses. In her research, Barbara was assisted by several senior investigators including Dr. Mark Eller (see the following), whose research focused on the role of telomere-initiated DNA damage responses; Dr. Hee Young Park (see the following), who investigated melanocyte biology and melanogenesis; Dr. Thomas Ruenger, whose research included UV-induced DNA damage, among other topics; Dr. David Goukassian, who investigated the role of telomere-homolog oligonucleotides in augmenting DNA repair capacity and reducing photocarcinogenesis; and myself, who became interested through studies on melanocytes in Alzheimer's disease. Research papers from Dr. Gilchrest laboratory were published in top basic science journals



Fig. 1. The inauguration of the dermatology building at Boston University School of Medicine. From left to right: Dr. Yaar, Dr. Chobanian (Dean of the School of Medicine), Dr. Gilchrest, Dr. Bhawan.

including *Science*, *Nature*, *Journal of Cell Biology*, *Journal of Clinical Investigation*, and *Journal of Biological Chemistry*.

In her role as co-director of the joint Boston University/Tufts dermatology residency program and director of an NIH-sponsored postdoctoral research training program, Dr. Gilchrest fulfilled one of the goals dearest to her: shaping the next generation of dermatologists and dermatology researchers. She was determined to help each resident reach his/her goal by enabling any interested resident to take time off from the clinical training and pursue a 6-month elective in his/her area of interest. Under her leadership and with the fundamental contribution of Dr. Amal Kurban, Barbara also opened the dermatology department at Boston University to trainees from



Fig. 2. Dr. Gilchrest and colleagues. From left to right: Dr. Eller, Donna McGuire (administrative assistant), Dr. Ruenger, Dr. Yaar, Dr. Park, and Dr. Koh.



Fig. 3. Dr. Gilchrest, Dr. Phillips (to the left of Dr. Gilchrest), and trainees.

all over the world. Together with Dr. Kurban, and later Dr. Ruenger (see the following), she created a unique International Graduate Training Program in which foreign physicians were given “hands on” training in clinical dermatology side by side with American residents, fostering long-standing relationships between the department and physicians overseas, some of whom became leaders in dermatology in their native countries.

Had I tried to summarize Dr. Gilchrest’s CV, the article would be too long. Just to illustrate some of her achievements: she is the author of over 400 scholarly articles, reviews, abstracts, and textbook chapters, as well as author or editor of eight books. She is a past President of the Society for Investigative Dermatology, the Women’s Dermatologic Society, and the Association of Professors of Dermatology. Dr. Gilchrest has also served as a Director of the American Board of Dermatology (1986 to 1996) and on the Board of Directors of the American Academy of Dermatology (1995 to 1999). She is the editor of the *Journal of Investigative Dermatology* and, in this capacity and under the themes of “The Year of Unity,” “Unity in Action,” and “Progress in Translational Research,” has made an impact by urging different constituencies, including researchers, practicing dermatologists, the pharmaceutical industry, and patient advocates, to work together to achieve the ultimate goal of improving skin health. She has also served as associate editor or editorial board member of several major clinical and research journals, and as a consultant or scientific advisory board member for large pharmaceutical and biotechnology start-up companies. She is a member of the MIT Corporation and of the National Academy of Medicine.

To conclude my portion of the article, I cannot begin to illustrate the impact that Dr. Gilchrest had on my life and my career. I met Dr. Gilchrest in 1981, as a first-year resident in dermatology, to discuss possible research opportunities. While clearly I recollect that others have discouraged me from following my dream of dermatology research, telling me how difficult and impossible it would be to secure funding for research, Dr. Gilchrest, in her naturally optimistic way, encouraged me to apply for a Dermatology Foundation Fellowship. Needless to say that after I “wrote” the grant application; Dr. Gilchrest “improved” it (substantially), something that she did in a single night (as I was late giving her the application) and . . . I received the fellowship award! This was the beginning of the most wonderful relationship, with Dr. Gilchrest’s constant support for every project



Fig. 4. Thank-you letter from former laboratory trainees.

that I undertook, frequently encouraging me to venture into undertakings that I would not have taken on had she not instilled the confidence in me. It was she who pushed for my academic promotions, and she who, through personal example and numerous conversations, convinced me that I could attain each of my goals. I could not complete the article without mentioning what a good friend Dr. Gilchrest is. I always felt that I could turn to her for help in my personal life and she consistently helped me and my family in any way she could.

When I approached former colleagues and asked them to write a brief summary of their interaction/relationship with Dr. Gilchrest, the response was exuberant. Below are quotations from people who worked closely with Dr. Gilchrest and whose life she has impacted.

Jag Bhawan, MD:

Dr. Gilchrest recruited me to head the Dermatopathology section on January 1, 1986. I had mixed feelings in leaving an established dermatopathology laboratory, tenured professorship, and a great chairman at the University of Massachusetts Medical School. I was

giving all of that up for a nontenured position, to start a new laboratory with many unknown factors, not to mention that my commute to work would be five times longer than before! Barbara's willingness to grant me autonomy allowed me to grow a Dermatopathology section of which anyone could be proud.

Dr. Gilchrest's vision and support for an independent Dermatopathology section within the Department of Dermatology was vital to the success of this program. In addition, Dr. Gilchrest was a great promoter of research and other scholarly activities. I had the privilege to work with her on multiple research projects.

Additionally, under Barbara's leadership, four endowed professorships (Herbert Mescone, Jag Bhawan, Barbara Gilchrest, and Guido Majno), one career development award (Amal Kurban), and two international fellowships (Subimal Roy and Hari Tandon) were established in our department, supporting dermatologists and dermatology researchers in their early and mid-career. Moreover, to my knowledge she was the first Dermatology chairman ever to have a university build a building dedicated solely

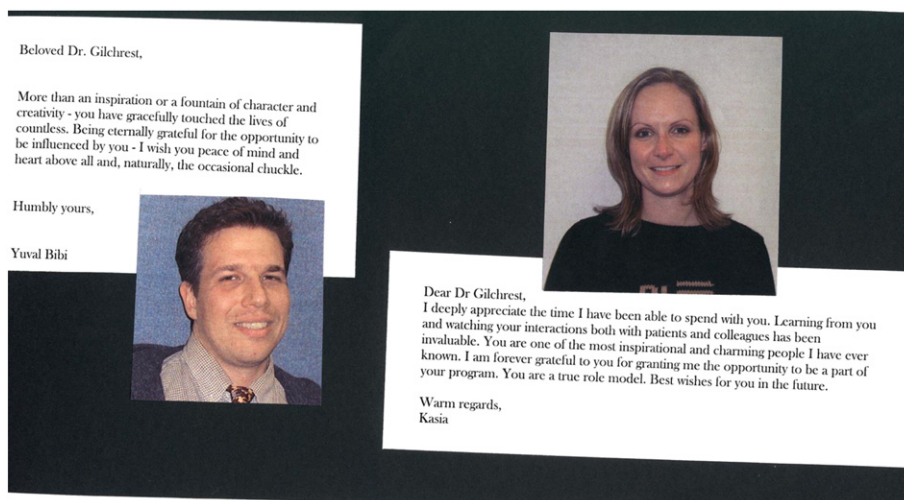


Fig. 5. Thank- you notes from former residents.

to Dermatology. It was a pleasure and a privilege to work with Dr. Gilchrest!

Tania Phillips, MD:

I first met Barbara Gilchrest in 1985 when I came from England looking for a position in dermatology. She managed to put together some funding for me, and I have been at the Dermatology department at Boston University ever since then, starting as a lowly fellow and, with her guidance, becoming a full professor in 1998.

At that time there were very few women in leadership roles in dermatology. Barbara was a role model for us all. She managed to juggle an incredibly productive research laboratory, a busy clinic, editorship of several dermatology journals, national and international travel, a hectic speaking schedule, as well as raising a young family. Despite how busy she was, Barbara always found time to talk to and mentor anyone who asked for her help, ranging from medical students interested in a career in dermatology to her

faculty. She was always willing to give anybody a chance, particularly those who had taken a less-than-traditional route to dermatology. Barbara was quick to recognize that foreign-trained dermatologists can contribute an incredible amount to the knowledge and diversity of a large department. Many of the faculty, including myself, had come from other countries, and rather than turning us away, she worked with us and with the university to give us an academic home.

She was persistent and passionate about getting funding and space for her department. Under her leadership, we moved from a tiny set of rooms in the K building to a six-story, freestanding building on Albany Street, the envy of dermatology departments across the country.

I am very grateful to Barbara for giving me the chance to pursue a career in the United States. She gave me the freedom to pursue my own interests, but at the same time was always there for me when I had a problem or needed career advice. She was very supportive and sympathetic during difficult times but was often able to come up with novel solutions to problems and always pushed me to do my very best. Many thanks, Barbara!

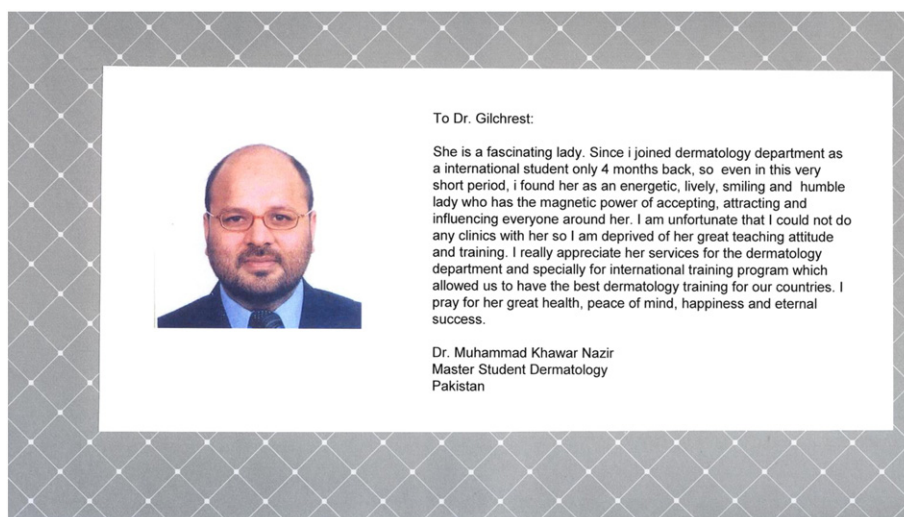


Fig. 6. Thank- you note from former international trainee.



Fig. 7. Reflection from a former resident.

Thomas Ruenger, MD, PhD:

Barbara has influenced me in so many different ways, but two stand out: The first is her way of scientific thinking. As a true physician-scientist, she is always thinking about any research results in the context of their broader relevance in physiology and medicine. Her questions, comments, and feed-back in the weekly lab meetings were always on point and provided clear perspective and guidance. I am very grateful for the many years of this experience and mentorship, which made me a clearer scientific thinker and helped me develop my own career as a clinician scientist. The other large influence is her vision to extend dermatology training to the worldwide community. In 1988, together with Dr. Amal Kurban, she founded the International Graduate Training Program in Dermatology at Boston University. Since then, more than 100 physicians from 29 different countries have received world-class dermatology training and earned various Boston University degrees, including Master of Science and Doctor of Science in Dermatology degrees. The vast majority of the graduates of this program have returned to their home countries, improving the care for patients with skin diseases in so many different corners of the world, and many have achieved prominent leadership roles at academic and nonacademic institutions in their countries of origin. She entrusted me the directorship of this program in 2007, a position I held until my departure in 2014 to become the Chair of the Department of Dermatology at Roger Williams Medical Center in Providence, Rhode Island. I deeply cherish this experience, as it taught me the deeply satisfying rewards of being an academic teacher. Graduates have become friends. Their gratitude and their success is our reward and has become one of the biggest sources of pride in my life. Barbara's vision and ability to establish this program against many odds made it all possible!

Mark Eller, PhD:

I've known Barbara Gilchrest since I interviewed with her for a position as Staff Scientist in the Cutaneous Gerontology Laboratory at the USDA Human Nutrition Research Center on Aging at Tufts University. I remember telling her that I wasn't getting any better at

doing northern blots, so I wanted to spend more time teaching others how to do them. She must have liked that because I was hired and that began a partnership that lasted for over 23 years. Although I didn't realize it at the time, what I was describing was a kind of mentorship. You take someone's skills and teach that person to use those skills in ways they didn't know they could, in ways they never would have. Barbara excelled at this type of mentorship.

Through the years, Barbara taught many students, gave many lectures, wrote many books and peer-reviewed scientific articles, and on and on. Many people will write about these things here, so let me mention a few more personal observations. The first is that Barbara stood by her scientists. If you were her enzymologist, you were the best. If you were her photobiologist, you were the best. This dedication is rare. It is also daunting when you're put in front of other enzymologists and photobiologists. But that fosters personal and professional growth.

Second, instead of running the research program in a didactic manner, Barbara let the expertise of her research faculty strongly influence their research paths. Without this degree of independence, the role of protein kinases in melanogenesis, so elegantly demonstrated by Dr. Park, may not be recognized today. I also like to think that the contribution of DNA damage responses, an interest of mine dating back to my graduate school years, to UV-induced pigmentation is now better understood because Barbara let me follow a hunch and see if a process that occurs in bacteria may happen, although in a somewhat different manner, in mammalian cells. It was all such fun. These are just a few examples. I'm sure each research faculty member could come up with their own stories.

Finally, after all the hard research was done, there were other questions I remember. Barbara would come to me to calculate molarity and I would go to her for advice about proper English. And then there was this: "Mark, I was invited to give a lecture in Venice, Italy, but have a scheduling conflict. Would you mind going in my place, all expenses paid?" Let me think.

Hee-Young Park, PhD

My life's story as a scientist, a mother, and a medical school administrator would not be complete without Barbara being at the center. I joined the Department of Dermatology at Boston University

School of Medicine in 1990 as an assistant professor and started to build a laboratory studying melanogenesis under the guidance of Barbara, who was the chair. A year later I had my first child, so the start of my motherhood and my scientific collaboration with Barbara coincided. Our collaborative efforts resulted in identifying a key role of Protein Kinase C-beta (PKC-beta) in the regulation of melanogenesis. As our scientific collaboration blossomed, I had a second child a few years later. The birth of my second child forever bonded me with Barbara beyond the laboratory. I started to go into labor in my office while trying to finish a PKC-beta review article, thus needing to be rushed to a hospital. As there was no time to wait for an ambulance, Barbara dropped all her work and drove me to the hospital, speeding through busy Boston streets, yelling "Goodness!! Your contractions are 2 minutes apart—please hold. I am just a dermatologist—I cannot deliver a baby!" Thanks to Barbara, my second child was born safely (about 30 minutes after arriving at the hospital), the review article was published (Barbara finished and submitted it), and my second child graduated from college this year.

During the past two decades, Barbara mentored not only me but many, many others using her talents and skills as scientist, physician, and administrator, and mostly by being a colleague who was always willing to extend a helping hand. When she stepped down as the chair several years ago, I also moved on to be an administrator at Boston University School of Medicine. I now apply all the skills I learned from Barbara in my role as an Assistant Dean in the Division of Graduate Medical Sciences. Barbara and I now share and enjoy our friendship and life beyond science, lab, and career.

Finally, when Dr. Gilcrest decided to step down from the chair position, former colleagues, friends, and trainees "showered" the department with letters of gratitude and wishes for best of luck for the future. These were collected into an album. This article would not be complete without a small sample of these displayed below.

It is so clear to me that when Dr. Gilcrest would reflect back on this chapter in her life, looking at her impact; contributions; achievements; and effect on associates, trainees, colleagues, and friends, she would be extremely pleased. Very few people, man or woman, could claim such accomplishments. I am happy that I was able to be part of such highly deserved editorial.

Dr. Gilcrest was asked to add a segment to this article describing the personal side of her career path, something that might be helpful or at least thought-provoking for our readers.

I had the good fortune to be raised in a wealthy suburb of New York City, a town with a good public school system and many well-educated professional families. From an early age, I loved to read and to imagine a future situation quite different from that of my family: an under-employed—mostly unemployed—father, stay-at-home mother, and rebellious younger sister living in near-poverty in my grandmother's home, literally on "the wrong side of the tracks." I immersed myself in school, the world of ideas, and a small circle of friends with similar interests.

My life direction was enormously influenced by a chance event: my best friend's father, an engineer, wanted his daughter to attend the Massachusetts Institute of Technology (MIT) and, to coax her into visiting, suggested she bring a friend on a college tour of Boston. It was my only opportunity to have such an experience, as there was no money set aside by my family to cover the modest costs and, in an extended family in which no member had ever attended college, no appreciation of the importance of a higher education or the differences among institutions. I jumped at the invitation and, as a top student in my high school (at graduation, the valedictorian), was granted interviews at Radcliffe (Harvard), Wellesley, and MIT. I fell in love with MIT's sense of purpose, involvement in real-world problems, and lack of social

pretensions. At that time, nearly half of the MIT undergraduates were the first in their family to attend college and financial aid was the norm. A few months later, offered early admission and a full scholarship, my fate was sealed. (My friend chose Stanford.)

Abandoning my magical adolescent ambition of hosting a literary salon in 19th-century St. Petersburg or Paris as my life-work, I immersed myself in mathematics, physics, and biology, although I also managed 2 years of French literature and 4 years of Russian language, perhaps as a security measure. When, after 3 years at MIT, I realized my world-of-the-mind would soon be behind me, I sought advice from a very approachable professor of biology and electrical engineering, who was also trained as physician. He recommended medical school, a path well-aligned with my excitement over the rapidly evolving field of molecular biology. A year later, in a second decisive career step, I matriculated at Harvard Medical School (HMS).

On the more personal side, I had benefited from the fact that MIT's undergraduate body was 99% men my freshman year, decreasing only slightly over 4 years. Lots of study dates! By my junior year, I had entered into a serious relationship with a student in the MIT School of Architecture. We married in 1967, immediately after my graduation, when he had already been living on the West Coast for a year, enrolled in a graduate program in part to avoid the Vietnam War draft. In a difficult decision, I chose to return to Boston for medical school, separating from my now-husband for a second year. When we reunited in Boston the following year, the marriage continued to be characterized by stresses—little money, huge demands on both of us for school or work, tensions over whether and when to start a family. Neither of us scaled back what by then had become very ambitious career plans. When the first child arrived in 1975, I was beginning my third year of dermatology residency and combined my 2 weeks per year of vacation time from years 2 and 3 to create a 4-week "maternity leave," resulting in no vacation for 2 grueling years. When the second child arrived 2 years later, I had just started up an NIH-funded laboratory as a first-year HMS faculty member, took a 1-week maternity leave, and kept tracking. Having two children in diapers while meeting all the demands of a budding academic career was possible with the assistance of a full-time (later, live-in) nanny, but the family suffered. Resentments developed, some conscious and some not. To assuage my guilt over 10-hour work days, compounded by frequent meetings and visiting professorships all around the world, when home I parented intensively, cooked all meals, and kept house. Still, I missed so many school events, sports events, and especially one-on-one time with my boys and husband. As one example of my priorities, I was away from home for Mother's Day every year of my boys' childhoods, attending the Annual Meeting of the Society for Investigative Dermatology. (Of note, the meeting days have recently been shifted to exclude that Sunday.) As another example, for nearly 10 years while serving on the American Board of Dermatology (ABD), I was away for Halloween because it conflicted with the annual fall meeting in Chicago. (I hope that, with more mothers serving as ABD Directors, that has also changed, but I don't know.) After a third child, and nearly 20 years into the marriage, my husband and I divorced. It was a very difficult time for all, perhaps especially for our three sons, then aged 5, 13, and 15.

My own mental and emotional health was eventually salvaged by meeting an exceptional man, also driven by career ambitions that had alienated his spouse, leaving him also alone at mid-life. Although it is extremely unlikely we could have bonded as immature, ambitious 20-somethings, after learning some of life's difficult lessons and having achieved at least some of our individual professional goals, it was easy. We finally knew ourselves and could recognize in each other what was good and what needed simply to be accepted. Twenty years later, we have a relationship close to what has been described as happily-ever-after. Our now-adult children from our respective marriages seem genuinely

comfortable with us and understanding of our choices, although none would describe his or her childhood as idyllic.

Can anyone, especially a woman, have it all? What does a woman blessed with good health, a good mind, and a good education owe to the world? Herself? Her children? Other women just beginning along

the same path? If there are really any answers to these questions, I certainly don't know of them.

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