

Dermatopathology

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THE HISTORY OF DERMATOPATHOLOGY at the Massachusetts General Hospital (MGH) is a rich and long one, dating back to the second half of the nineteenth century and continuing to the present day. It features close interaction between the Dermatology and Pathology departments, beginning in Dermatology and then becoming a specific Dermatopathology Unit in the department of Pathology in the 1960s. The history includes luminaries in the field, such as Drs. James C. White, John T. Bowen, Walter F. Lever, Wallace H. Clark Jr., and Martin C. Mihm Jr., and major discoveries, perhaps most notably in the area of skin neoplasia. A number of eponymous skin diseases and tumor staging systems are associated with individuals who worked at the MGH, attesting to the influential role of MGH Dermatopathology over the years.

THE EARLY YEARS: WHITE AND BOWEN

The roots of dermatopathology at MGH can be traced to its companion clinical discipline, dermatology, which itself dates to 1869 at MGH, when Dr. James Clarke White began an outpatient clinic for patients with diseases of the skin (figure 18.1). He graduated from Harvard Medical School (HMS) in 1856 and then studied in Vienna with the great dermatologist Ferdinand von Hebra. Von Hebra is considered the first person to bring careful pathological study to diseases of the skin, and an appreciation for the

role of pathological investigation was doubtless imparted to Dr. White during his time in Vienna. Dr. White returned to Boston, and his versatility as a physician is illustrated by the fact that he began his career at MGH as a clinical chemist, serving in that capacity from 1863 to 1872; but he was interested primarily in dermatology and devoted his practice to it after 1872. Once he had opened the outpatient clinic, he began a two-year debate with other MGH physicians and surgeons on the need for a special “Skin Ward”; this special ward was formed, but it closed in only a year, and Dr. White was appointed to the Out-Patient Department, as Physician to Out-Patients with Diseases of the Skin. He was a prolific writer, served as an Editor of the *Boston Medical and Surgical Journal* (the precursor to the *New England Journal of Medicine*), and was the first professor of dermatology in the United States (at HMS). In keeping with his training under von Hebra, some of his works contained detailed descriptions of cutaneous pathology (34). His family would also go on to prominent positions at the MGH, his son Charles J. White (see below) serving as Chief of Dermatology and his grandson, also named James C. White, becoming Chief of Neurosurgery.

One of Dr. White’s trainees was Dr. John Templeton Bowen (figure 18.2). Dr. Bowen had graduated from HMS in 1884 and studied in Germany and Vienna before returning to the MGH in 1889



Figure 18.1 James Clarke White

as Assistant Physician to Out-Patients with Diseases of the Skin. He went on to become the first Edward Wigglesworth Professor of Dermatology at HMS in 1907 and was Chief of the Dermatology Service at MGH from 1911 to 1913. Dr. Bowen did seminal and extremely careful work in understanding the microscopic pathology of skin diseases, the most notable being his descriptions of in situ squamous cell carcinoma (3), known subsequently as Bowen's disease. He collaborated and published with pathologists, including Dr. S. Burt Wolbach, the Chair of HMS Pathology, and was a member of the American Association of Pathologists and Bacteriologists. Indeed, some felt that this quiet man may have liked his microscope better than his patients. According to Dr. Charles J. White, "Dr. Bowen was by nature a student. He loved quiet: he loved his microscope, and he loved to ponder over things—to 'mull' over them was a frequent word on his lips. He



Figure 18.2 John Templeton Bowen

much preferred this type of life to the public area of hospital practice and teaching" (32). In a historical sense, therefore, Dr. Bowen can justifiably be considered the first dermatopathologist at the MGH.

After Dr. Bowen's tenure, Chiefs of Dermatology included Drs. Charles J. White (son of Dr. James C. White; 1913–1927), Harvey P. Towle (1913–1925, with Dr. White), E. Lawrence Oliver (1927–1936), and C. Guy Lane (1936–1947). Some of these individuals did clinicopathological correlations of dermatological disease and published interesting case reports on a variety of conditions. For example, Dr. White published an article with Dr. Oscar Richardson of Pathology (chapter 3) on cutaneous leprosy in 1909 that included detailed histopathological and bacteriological examinations and that acknowledged Dr. Bowen's help with the case (33). A prominent MGH dermatologist from 1921 to 1937 was

Arthur M. Greenwood, who also worked at New England Deaconess Hospital. He published a number of papers that had dermatopathological correlates, including ones with the MGH Pathology department and on the skin of diabetics with Dr. Elliott Joslin (chapter 3). His papers reflect close interactions with MGH Pathology, such as his acknowledgment in a 1922 paper on hemangiosarcoma of the skin of “indebtedness to Dr. J. Homer Wright and to Dr. Charles J. White for their valuable suggestions and aid in interpretation of the sections” and his reference to Dr. Wright in the text (14). Dr. Wright himself had also published on dermatopathology, including one of the detailed early histological descriptions of cutaneous leishmaniasis, an article in which he acknowledged his close interactions with Dr. White on the case (36).

THE LEVER ERA

Walter F. Lever was born on December 13, 1909, in Germany and obtained his medical degree in Leipzig (figure 18.3). His father, Alexander Lever, was a prominent dermatologist in Germany. In the 1930s Walter Lever became one of many physicians who left Germany in an exodus to the United States because of the rise of Nazism. He joined the MGH in 1936 as a research fellow and resident on the Dermatology Service. In that year Guy Lane had become Chief of Dermatology and had expanded the training program to two years and doubled the number of residents, giving Dr. Lever “some spare time” that he “spent in the Pathology Laboratory” (19), thus beginning his long association with MGH Pathology. His description of his early interactions with Pathology attests to the novelty of a dedicated dermatopathologist: “The members of the Pathology Laboratory were not used to seeing a dermatologist among them. They frankly admitted that their know-how in dermatopathology was not exactly overwhelming. When I suggested to Ben Castleman [who was finishing his pathology training in the mid-1930s] that perhaps we might learn it



Figure 18.3 Walter F. Lever

together he agreed to it. In working with him in dermatopathology I learned a great deal of general pathology. With only brief interruptions the Pathology Laboratory at the Massachusetts General Hospital was a ‘second home’ to me for more than 20 years” (19).

Dr. Lever was appointed to the Dermatology faculty in 1944, and he continued his close relationship with Pathology, reviewing the skin biopsies with the residents. He is best known for his widely read textbook, *Histopathology of the Skin*, originally published in 1949 and now in its ninth edition (20). This successful text is a reflection of Dr. Lever’s important role in the forging of a strong relationship between the departments of Pathology and Dermatology at the MGH. In 1949 this close bond was portrayed in the preface to the first edition of his textbook: “I wish to express my deep gratitude to Dr. Tracy B. Mallory and Dr. Benjamin Castleman of the Pathology

Laboratory at the Massachusetts General Hospital for the training in pathology they have given me. It has been invaluable to me. Their teaching is reflected in this book.”

Dr. Lever was also known for his original work in the field, including his description of bullous pemphigoid in 1953 (21). In 1959 Dr. Lever left the MGH to become the Chairman of the Department of Dermatology at Tufts University Medical School; despite this move, he was retained as a consultant to the MGH and Honorary Dermatologist for more than 20 years. Dr. Lever had an infectious enthusiasm about dermatopathology diagnosis and teaching. He was considered by many in Boston to be a type of Red Baron: he attended and supported the citywide dermatopathology review sessions, driving his open convertible in the winter, a red scarf fluttering behind him in the wind. Dr. Walter Lever married a young German student in Dermatology, Gundula Schaumburg, who was on elective in Dermatology at the MGH. Dr. Schaumburg-Lever was an electron microscopist, and she and her husband worked on several editions of his textbook as well as scientific papers on skin disease. Dr. Lever died in 1993.

Dr. Lever trained an entire generation of pathology and dermatology residents in dermatopathology at the MGH. Of note was Dr. Alexander Breslow, who was a resident in MGH Pathology from 1955 to 1959. Dr. Breslow went on to a highly successful career in surgical pathology at George Washington University, where he published seminal papers correlating melanoma depth of invasion with prognosis. This measurement of the primary tumor thickness came to be known as the Breslow measurement and remains the most relied-on staging factor for patients with localized melanoma at presentation (4, 27).

THE CLARK ERA

Wallace H. Clark came to the MGH in 1962 (figure 18.4). He was born in 1924 in LaGrange, Georgia. He received his bachelor's degree in 1944

and M.D. in 1947 from Tulane University, where he continued to work, rising to become Professor of Pathology before his move to Boston. Upon joining the MGH in 1962, with the support of the Chief of Dermatology, Thomas B. Fitzpatrick, Dr. Clark set up an electron microscopy research laboratory on the Dermatology floor of the Warren Building. His work in this facility yielded descriptions of dermal-epidermal separation in bullous pemphigoid, dermatitis herpetiformis, and erythema multiforme, as well as the ultrastructural mechanisms of melanin synthesis. Dr. Clark's contributions to clinical dermatopathology over the next seven years included the publication of the first classification of melanoma and the identification of histopathological prognostic factors, including the anatomical extent of invasion, now termed the Clark level. The original melanoma classification remains in use a half century later (5, 30). Benjamin Castleman's 1967 Annual Report noted: "Dr. Wallace Clark's electron microscopic studies have been directed toward accumulating evidence regarding the abnormal formation of melanin by the malignant melanocyte. He has shown that the large epithelioid melanoma cell of superficial spreading melanoma forms melanin in a distinctively different structural way than do the normal epidermal melanocytes. He has further found that the melanosome, used as a cytogenetic marker, indicates that a given tumor nodule may contain more than one type of melanocyte." This early understanding of melanocytic heterogeneity serves as the foundation of translational science in the melanoma field today, including drug discovery and investigations of melanoma initiating cells (13, 25). Dr. Clark also established the first multidisciplinary pigmented lesion clinic, in collaboration with Drs. Thomas B. Fitzpatrick (Dermatology), John Raker (Surgery), and Martin C. Mihm Jr. (Dermatology).

During Dr. Clark's tenure, he trained and mentored several future leaders in dermatopathology, including Drs. Richard W. Sagebiel, Martin C.

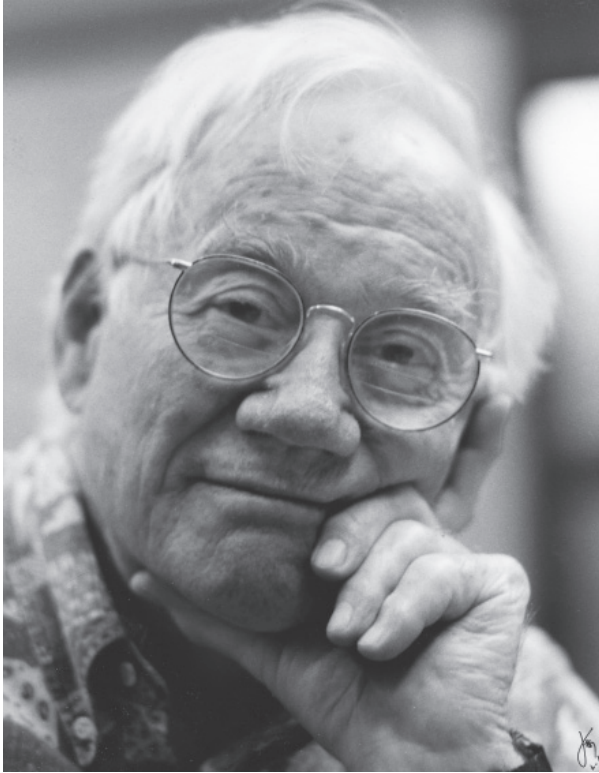


Figure 18.4 Wallace H. Clark

Mihm Jr., A. Bernard Ackerman, and N. Scott McNutt. Dr. Sagebiel, a clinical research fellow in Pathology in 1962, was one of many MGH Pathology trainees to become a dermatopathologist. He moved from Boston to join the University of California–San Francisco (UCSF) in 1970, where he helped establish the UCSF Melanoma Clinic in 1971 with Dr. M. Scott Blois, embarking on a career as a world-renowned melanoma expert. In 1964 Dr. Mihm joined the MGH as a resident in Dermatology. The ensuing decade marked an exciting time for dermatopathology, as he and Clark made groundbreaking progress in the classification and diagnosis of cutaneous melanoma. In 1967 Bernard Ackerman came to the MGH as a clinical assistant in Dermatology to complete his dermatology residency training with the aim of studying dermatopathology with Dr. Clark. Drs. Clark and Ackerman had active debates regarding the diagnosis and classification of melanoma. Dr. Clark taught that there was

a gradual transition from benign to malignant neoplasms, a biologic evolution, and focused his work on identifying prognostic factors. Dr. Ackerman, on the other hand, believed that there was a clear-cut distinction between benign nevi and malignant melanoma, and that the job of the dermatopathologist was diagnosis rather than determining prognosis. Dr. Ackerman continued to teach these concepts after leaving MGH and became an internationally recognized albeit controversial figure in the field. He published an algorithmic approach to diagnosis in *Histologic Diagnosis of Inflammatory Skin Diseases*, founded on Dr. Clark's reaction patterns of the skin. This reference became a necessary part of every dermatopathologist's library, alongside Dr. Lever's *Histopathology of the Skin*.

A number of other trainees of the program in the late 1960s and early 1970s went on to serve the MGH or other institutions as dermatopathologists. Dr. Joel Umlas was a resident in MGH Pathology from 1964 to 1967; he served in the Army for two years and returned to become a faculty member in 1969. A year later, Dr. Umlas left the MGH for Mount Auburn Hospital in Cambridge; he has continued his collaborative relationship with the MGH over the past four decades (chapter 22). In 1968 Dr. Neil Scott McNutt came to the MGH as a clinical and research fellow in Pathology to study intercellular communication. Using the freeze-fracture technique in collaboration with Dr. Ronald Weinstein, Dr. McNutt was able to obtain high-resolution images of the internal structure of plasma membranes. They found that the nexus, or “gap junction,” was lost in early stages of malignant transformation and that contact inhibition was correlated with the presence of aggregates of cytoplasmic microfilaments that are involved in cell motility. In 1969 and 1970 Eugene Mark, Bruce Ragsdale, Thomas M. Chesney, and John Kaiser were residents in pathology and went on to train in dermatopathology.

In 1969 Dr. Clark left the MGH to join the

faculty at Temple University as a Professor of Pathology, serving as chairman of that department from 1974 to 1978. Concerning who would be Dr. Clark's successor in Dermatopathology, Dr. Castleman favored Dr. Ackerman, but Dr. Clark and Dr. Thomas B. Fitzpatrick, Chief of Dermatology, favored Dr. Mihm (Thomas B. Fitzpatrick, personal communication with Lyn Duncan). According to Dr. Castleman's report for that year, "With the support of Dr. Thomas B. Fitzpatrick, Chief of the Dermatology Service, Dr. Martin C. Mihm, a graduate of the Dermatology Service and recently in charge of research and teaching dermatology at the USPHS Hospital in Staten Island, returned to the hospital to obtain training in General Pathology." Dr. Mihm quickly became the liaison member with the Dermatology Service, succeeding Dr. Clark.

THE MIHM YEARS

Martin Charles Mihm Jr. was born in Pittsburgh on March 15, 1934 (figure 18.5). He graduated from Duquesne University in 1955 and the University of Pittsburgh School of Medicine in 1961. After training in internal medicine at Mount Sinai Hospital in New York, he joined MGH as a trainee in Dermatology in 1964. His training was followed by early, pioneering work in collaboration with Drs. Clark and Fitzpatrick that had a global effect on the diagnosis of melanocytic tumors. Dr. Mihm continued to make weekly visits to the MGH during his years in the military service at Staten Island. He served as a liaison between the departments of Pathology and Dermatology and expanded the teaching program so that residents in both Dermatology and Pathology were exposed to special instruction in dermatopathology. He returned to the MGH to complete his training in Pathology, and in 1974 he was appointed by Benjamin Castleman to succeed Dr. Clark as the Chief of the MGH Dermatopathology Unit and to continue as the Codirector of the MGH Pigmented Lesion Clinic, with Dr. Thomas Fitzpatrick.

In the 1970s multidisciplinary melanoma centers evolved through the Malignant Melanoma Cooperative Group, supported by the National Institutes of Health as part of President Nixon's "war on cancer." In one of the first multidisciplinary trials, the investigators studied the natural history of cutaneous melanoma in over 1,100 patients from the MGH, New York University, Temple University, and later the University of Pennsylvania and UCSF. Dr. Mihm was pivotal in this effort, as was Dr. Arthur Sober, whom Fitzpatrick recruited to coordinate this project, which led to more than 30 publications regarding the diagnosis and prognosis of patients with melanoma. In 1973 Drs. Mihm, Fitzpatrick, and others published an atlas of early detection of cutaneous melanoma in the *New England Journal of Medicine*, which was the first time that color had been used in the journal (22). Indeed, the American Cancer Society distributed 100,000 copies of this landmark publication as a melanoma education effort, the first of many endeavors in early melanoma screening and detection.

In addition to his interest in melanocytic tumors, Dr. Mihm was also fascinated by the biology of host response. In the early 1970s he collaborated with Drs. Harold Dvorak and Robert Colvin of MGH Pathology in studies that focused on cutaneous basophil hypersensitivity. After developing suitable embedding and sectioning techniques, they found that basophils represented 10–15 percent of the infiltrate in allergic contact dermatitis to poison ivy—in a biopsy from Dr. Dvorak's own arm (10). With the support of an NIH grant for human studies, this work was expanded to examine a variety of immunological lesions in the skin of 100 human volunteers, since the hypersensitivity-associated changes observed in human skin were not apparent in animal models and required a human clinical study. Drs. Ann Dvorak and Richard A. Johnson collaborated in this work, which described basophil infiltration, mast cell and basophil degranulation, obliterative endothelial changes,



Figure 18.5 Martin Charles Mihm Jr.

and deposition of fibrin in the dermis as characteristic of delayed-type hypersensitivity (11).

The increasing volume of dermatopathology specimens as the 1970s progressed led to a need for additional faculty members. By 1974 Drs. Eugene Mark and A. Jane Lingeman had joined the service. After a few years in Dermatopathology, Dr. Mark decided to focus his efforts on pulmonary pathology and went on to become the Director of the Autopsy Service. Dr. Lingeman was an expert in melanoma diagnosis, having trained at the Royal Prince Alfred Hospital in Australia; she served on the MGH faculty for over a decade. In addition, as Robert McCluskey, the new Chief of Pathology at MGH, recorded, dermatopathology had begun to provide “expanded diagnostic immunofluorescence service for dermatology, including direct immunofluorescence studies of skin biopsies and measurements by indirect immunofluorescence of circulating

autoantibodies against skin components, as seen in pemphigus and bullous pemphigoid.”

THE FOUNDING OF THE HMS DERMATOPATHOLOGY FELLOWSHIP

In 1974 the first certifying board examination in dermatopathology was given to 205 dermatologists and pathologists who were allowed to take the examination on the basis of their experience rather than formal training. The idea for a more formal, accredited training program stemmed from discussions predominantly among two groups of physicians, the American Society of Dermatopathology (ASD) and the Dermatopathology Club. The ASD was established in 1962 by members of the Pathology Committee of the American Academy of Dermatology (AAD), including Dr. Walter Lever. This group held their first scientific meeting in 1963 and was populated largely by dermatologists. The Dermatopathology Club, on the other hand, was composed of a group of pathologists, including Drs. Clark, Mihm, and Richard Reed, who met regularly throughout the early 1970s to discuss and review dermatopathology cases. At a meeting held in the Ether Dome at the MGH, led by their President, Dr. Reed, the members voted to join the ASD to help found dermatopathology training programs.

The Harvard Dermatopathology Training Program was founded in 1975 by the chairs of the HMS Pathology departments, and Dr. Mihm was named Director. Its roots at the MGH, the Harvard Dermatopathology Training Program was one of five accredited programs in the United States. Drs. Antoinette Hood and Theodore Kwan were the first two clinical trainees in the program; Dr. David McLean was the first research fellow (figure 18.6). Drs. Hood, Kwan, and Mihm published one of the first systematic approaches to diagnosis in dermatopathology (17).

The late 1970s, the 1980s, and the early 1990s witnessed extensive activity in MGH Dermatopathology that involved clinical service, research, and teaching. Dr. Terence J. Harrist, after training

in pathology and dermatopathology at MGH, joined the faculty in 1980 when Eugene Mark decided to pursue a career in pulmonary pathology. In collaboration with Drs. George Murphy, Atul Bhan, and Mihm, Dr. Harrist investigated the ultrastructural and antigenic features of benign and proliferative Langerhans cells, providing key contributions to studies that ultimately established CD1a (then called T6) as a specific immunohistochemical marker (15, 23). His work in melanoma focused on early-stage disease and included the description of microscopic satellites as an important prognostic factor (6). Additionally, with Drs. Calvin Day and Arthur Sober, he participated in a landmark analysis of prognostic factors for patients with thin melanomas (7). Dr.

Harrist left MGH in 1982 to focus his efforts on the development of a private dermatopathology group in Boston, Pathology Services.

That year George F. Murphy, another graduate of the MGH Pathology and Dermatopathology programs, became the first Director of Dermatopathology at Brigham and Women's Hospital (BWH); he nonetheless continued to take regular rotations in signing out the MGH dermatopathology specimens. Dr. Murphy received the Benjamin Castleman Award (chapter 8) for his work on cell surface antigens in Langerhans cells. Dr. Murphy went on to a highly successful career in academic dermatopathology. In 1989 he left for Philadelphia, joining the faculty of the University of Pennsylvania and later becoming the



Figure 18.6 The first class of the Harvard Dermatopathology Training Program. Left to right: David McLean (research fellow), Eugene Mark (faculty), Antoinette Hood (fellow), Theodore Kwan (fellow), Martin C. Mihm Jr. (Program Director).

head of Dermatopathology at Thomas Jefferson University, returning to head Dermatopathology at BWH in 2002. His investigations in cutaneous immunology have led to an understanding of melanoma initiation and tumor cell escape from immune surveillance.

Other notable graduates of the MGH Dermatopathology Training Program in the 1980s included Drs. Thomas Flotte (see below) and Steven Tahan, Chief of Dermatopathology at Beth Israel Deaconess Medical Center and later Director of the Harvard Dermatopathology Training Program. MGH Dermatopathology graduates who joined the MGH faculty in the 1980s included Drs. Ben Bronstein, Randall Margolis, Michael Imber, and Hugh Randolph Byers. Dr. Bronstein left the MGH for a business career in a Boston-based biotechnology firm, and Dr. Margolis left to join the Dermatopathology group at Boston University and later served as a dermatopathology consultant to Harvard Community Health Plan. While at the MGH, Dr. Byers pursued melanoma research at the Charlestown Navy Yard laboratory (8); in the early 1990s he left the MGH to become the Director of Dermatopathology Research at Boston University, and in 2010 he moved to California to join the dermatopathology practice of Dr. Bruce Ragsdale, an MGH Pathology alumnus.

Throughout the 1980s Dr. Mihm enriched the teaching program with his consultation material and through visits to the other HMS hospitals. Many remember driving with Dr. Mihm in his dark gray Mercedes to each hospital to read dermatopathology cases set aside for his review. He also initiated a dermatopathology postgraduate course in the early 1980s that ran for four years. And in the late 1980s he established an annual visiting dermatopathology professorship; among the guest lecturers were Drs. Wallace Clark, Richard Reed, Wayne Streilein, Bernard Ackerman, and Steven Katz.

Dr. Samuel Moschella, Professor of Dermatology at HMS and Chairman of the Department

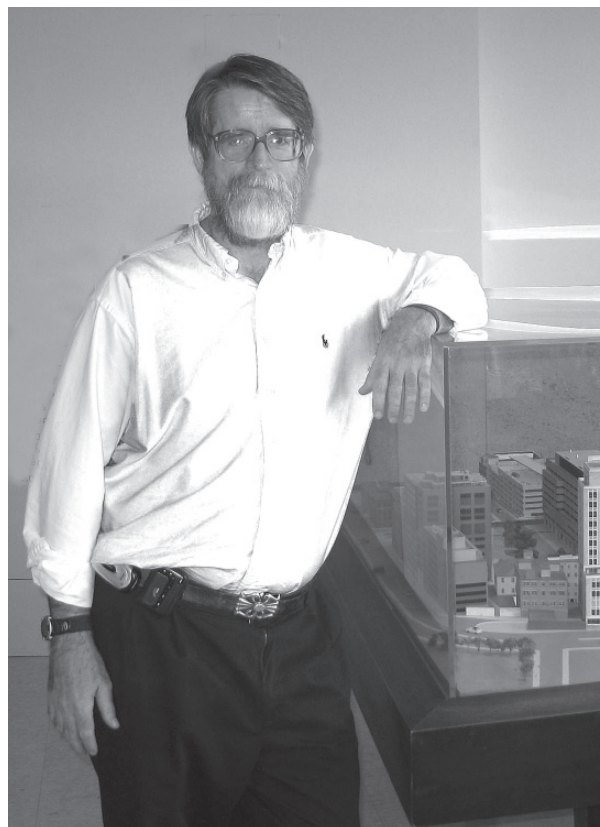


Figure 18.7 Thomas J. Flotte

of Dermatology at the Lahey Clinic since 1969, was an active participant in the Dermatopathology Conferences at the MGH. He achieved great fame, particularly as an expert in leprosy; he became President of the American Academy of Dermatology and was named a Master in Dermatology. In the 1980s, Dr. Moschella traveled to MGH for the weekly Thursday evening dermatopathology reviews with Drs. Mihm, Murphy, Harrist, and Flotte. He continues as a regular participant at MGH Dermatology Grand Rounds and the annual MGH Dermatopathology postgraduate course.

The Harvard Dermatopathology Training Program was a two-year fellowship. Trainees with a background in pathology spent six months in dermatology and attended nine clinic sessions at the MGH each week, including the famous Friday morning Pigmented Lesion Clinic. Those with a background in dermatology completed six

months of surgical pathology training, including the performance of autopsies; the remaining 18 months of fellowship were devoted to diagnostic dermatopathology and research endeavors. The trainees were based at MGH; they traveled throughout the HMS system in Dr. Mihm's Mercedes. In the early 1990s, however, there was a move to broaden the scope of experience and allow more interaction with the many expert faculty who had developed clinical and academic programs at BWH, Children's, Beth Israel, New England Deaconess, the Veterans Administration hospitals, and Pathology Services (which had a close affiliation with Beth Israel). In the early 1990s the training program shifted to a one-year format.

Shortly thereafter, as Wallace Clark was considering a return to Boston from Philadelphia, Terence Harrist (who held a faculty appointment at Beth Israel) and Harold Dvorak (then the Chair of Pathology at Beth Israel) proposed a separate HMS dermatopathology training program to be based at Beth Israel Hospital. Around this time Dr. Raymond Barnhill was the head of Dermatopathology at BWH, Steven Tahan was head of Dermatopathology at New England Deaconess, and Theodore Kwan was the chief dermatopathologist at Beth Israel. Ultimately, it was agreed that there would remain one HMS Dermatopathology Training Program, Dr. Mihm remaining Program Director, and with the provision that trainees could be based at MGH, BWH, or Beth Israel Hospital.

RECENT YEARS

Martin Mihm was presented the opportunity to start a department of dermatology at Albany Medical Center in 1993. He moved to Albany at the end of the year. With his departure, Lyn McDivitt Duncan (see below) was appointed as Interim Director of the Harvard Dermatopathology Training Program and Interim Chief of the MGH Dermatopathology Unit. Dr. Duncan invited Dr. Thomas Flotte (see below) to return to



Figure 18.8 Lyn McDivitt Duncan

clinical activities in the Dermatopathology Unit. In 1995, with the support of Dr. John Parrish, Chief of MGH Dermatology, Dr. Flotte became the Director of MGH Dermatopathology, and Dr. Duncan remained the Director of the Harvard Dermatopathology Training Program.

Dr. Flotte is a graduate of Albany Medical College and trained in anatomic pathology at the New York University Medical Center (figure 18.7). Shortly after completing his dermatopathology training at the MGH in 1984, he became involved in research supported by the Wellman Laboratories of Photomedicine in the MGH Department of Dermatology. In 1984 Drs. Mihm, Flotte and Margolis, with the enthusiastic support of Dr. John Parrish in Dermatology, founded the first Photopathology Laboratory Service as part of the Wellman Laboratories. Flotte joined the Dermatology Department in 1989 as Director of Photopathology and full-time



Figure 18.9 The Harvard Dermatopathology Training Program celebrates Martin Mihm's seventy-fifth birthday. Lyn Duncan, George Murphy (center), Steven Tahan (right), and Martin C. Mihm Jr. with a Festschrift copy of the Journal of Cutaneous Pathology

researcher in the Wellman Laboratories. He was responsible for landmark studies of laser-tissue interactions, including the effects of pulsed CO₂-laser and ER YAG laser on tissue ablation and the use of Q-switched ruby laser and Q-switched ND-YAG laser for the removal of tattoos (18, 26, 28, 31).

Dr. Duncan (figure 18.8) had joined the MGH in 1990 as a trainee in dermatopathology after completing anatomic pathology training at Washington University in St. Louis, where she was involved in a research program with Dr. Emil Unanue. She became a faculty dermatopathologist in 1991, joining Drs. Barnhill, Byers, and Mihm. Her collaborations with Drs. Mihm and Barnhill led to the largest U.S. study of pregnancy-associated melanoma (29). Her work in collaboration

with Millennium Pharmaceuticals led to the discovery of the melanoma prognostic marker, Melastatin (TRPM1/MLSN) (9, 12). Dr. Duncan's finding that routine processing of sentinel lymph nodes is associated with a 12 percent false-negative rate in detecting metastatic melanoma led to a revision of the sentinel lymph node analytical platform at MGH (37), and her collaboration with the MGH hematopathologists Dr. Nancy Harris and Dr. Judith Ferry led to revised diagnostic criteria for cutaneous B-cell lymphomas (2, 35).

In the mid-1990s Dr. Duncan and her codirectors of the Harvard Dermatopathology Fellowship (Drs. Barnhill, Harrist, and Tahan) made a series of changes in the program that would provide a more equal experience for all trainees in the program, regardless of their home institution. They established rotations at each institution for all trainees, including opportunities to participate in the consultative practices of Drs. Mihm (after his return to the MGH in 1996), Clark (then at Pathology Services), Harrist, and Barnhill; the MGH Pigmented Lesion Clinic with Drs. Arthur Sober and Hensin Tsao; the Cutaneous Oncology Clinic at the Dana-Farber Cancer Institute, which included Dr. Thomas Kupper's cutaneous lymphoma patients; clinics at Children's Hospital; Friday afternoon sessions with Dr. Harley Haynes at the Veterans Administration Hospital; and selected rotations providing exposure to subspecialty experts in pathology, including Drs. Nancy Harris (hematopathology) and Ben Pilch (ENT pathology) at the MGH, and Christopher Fletcher (soft tissue pathology) at BWH. Dr. Duncan enlisted codirectors at each



Figure 18.10 MGH Dermatopathology faculty, 2010–2011. Standing, left to right: Stephan Kraft, Mai P. Hoang, Rosalynn M. Nazarian, Adriano Piris. Seated: Lyn M. Duncan, Martin C. Mihm Jr.

institution; these included Drs. Flotte at MGH, Phillip McKee at BWH, Steven Tahan at Beth Israel Deaconess, and Terence Harrist at Pathology Services. In 2003, after Dr. Duncan had served 10 years as training program director, Dr. Tahan was appointed director, and it was decided that the directorship would rotate thereafter. In 2011 Dr. George Murphy at BWH will take the helm of the fellowship program. Notably, all the program directors to date (Drs. Duncan, Tahan, and Murphy) have been trained by Martin Mihm and have aimed to carry forward his legacy of excellence in teaching, investigation, and patient care (figure 18.9). To further the collaboration among the HMS Dermatopathology

faculty, Dr. Duncan established an annual post-graduate course in the early 1990s that continues to serve as a yearly teaching (and social) opportunity for trainees, faculty, and alumni. The Harvard Dermatopathology Training Program has continued its record of success, its graduates including endowed full professors, department chairs, heads of commercial dermatopathology laboratories and pharmaceutical companies, a university president, and numerous NIH-funded investigators.

In addition to Dr. Duncan, graduates from the fellowship who joined the MGH Dermatopathology faculty in the 1990s included Drs. T-Y Wong and Lisa Lerner. Dr. Lerner, after several

years on the MGH Dermatopathology faculty, joined Dr. Lisa Cohen to cultivate a highly successful private dermatopathology laboratory in Boston. In 2003 Dr. Vincent Liu graduated from the program and joined the faculty of MGH Pathology and Dermatology; after a few years of MGH service, he moved to Iowa to continue his clinical practice in dermatology and dermatopathology and recently coedited a dermatopathology textbook for trainees. After completing his pathology and dermatopathology training as a BWH-based trainee, Dr. Artur Zembowicz joined the faculty of MGH Dermatopathology in 2000 and became the director of the annual MGH Dermatopathology Continuing Medical Education Course. Dr. Zembowicz left the MGH in 2008 to serve as a consultant to the Lahey Clinic. Dr. Cynthia Magro, a graduate of MGH training programs in anatomic pathology, cytology, and dermatopathology, spent two years practicing pathology in her hometown in Winnipeg, Canada, then returned to the United States; she currently serves as the Chief of the Dermatopathology Service at Weill Cornell Medical College in New York City, replacing Dr. Scott McNutt, who retired to focus on his research efforts after 20 years of clinical service.

When Dr. Mihm returned to the MGH in 1996, he did so freed of administrative duties. He spent the next 14 years embracing the joys of teaching, research, and consultative diagnosis locally and abroad; the Dermatopathology Unit at the MGH was his home base (1, 16). His enthusiasm at the microscope and his contributions as an internationally recognized senior statesman continue to inspire students and colleagues. In 1998 he established the first multidisciplinary Vascular Malformations Clinic at MGH (24). This monthly clinic has become an internationally recognized clinical management resource. Dr. Mihm has recently started another chapter of his academic career: in 2010 Dr. Thomas Kupper recruited him to join the BWH Dermatology Department as Director of the Melanoma

Program and Codirector of the Melanoma Program at the Dana-Farber Cancer Institute.

In 2007 Thomas Flotte moved to direct dermatopathology at the Mayo Clinic in Rochester, and Dr. Duncan was appointed head of MGH Dermatopathology. Since then Drs. Adriano Piris, Rosalynn Nazarian, and Stefan Kraft have graduated from the training program and joined the MGH Dermatopathology faculty. Additionally, Dr. Mai Hoang was recruited to join the group in 2007, after beginning her career at the University of Texas Southwestern Medical Center. Today the faculty of MGH Dermatopathology includes expert diagnosticians with specific research programs in the areas of melanocytic tumors, cutaneous fibrosing disorders, adnexal tumors, and evolving diagnostic technologies (figure 18.10). Dr. Hoang is the director of the postgraduate course started in 1996, and she has expanded the curriculum to include virtual microscopic diagnosis online and maintenance of certification modules. All faculty are actively engaged in teaching, research, and diagnosis, continuing the models set by Drs. Bowen, Lever, Clark, and Mihm.

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