A Passion for Solving the Puzzle of Cancer: Jane Cooke Wright, M.D., 1919–2013

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When the Rubik's Cube became popular in the early 1980s, oncologist and cancer researcher Jane Cooke Wright, M.D., then in her 60s, bought one and immediately set to work on the twisty multicolored puzzle and solved it. From then on, no Rubik's Cube within her sight could escape her problem-solving determination, her daughter Alison Jones, Ph.D., recalled. Dr. Wright, who died Feb. 19, 2013, at age 93, brought that same passion and persistence to her work as a researcher and physician who was among the first to use drugs to treat cancer. It was also how she faced challenges as an African-American woman at a time when few women of color became physicians.

"She never gives up and never sees the 'No' in anything," Dr. Jones said of her mother in a 2010 interview [1]. "She just tries to think outside of the box and how it can be done and solved."

Dr. Wright's tenacity in working to solve the puzzle of cancer lives on in the many individuals and organizations she worked with and mentored throughout her 40-year career. She typified the perseverance and optimism that all who strive to make headway against cancer must carry within them. Dr. Wright began her career in cancer research and care in 1949, a time when most physicians regarded attempts to treat cancer with anything other than surgery or radiation as a waste of effort. Yet, seeing remissions in a few patients, if only for a short time, gave her great satisfaction and increased her determination.

"She was a woman in a man's world, and gently set about to change it, was creative, very well regarded, not bashful. She was looking for predictive activity for chemotherapeutic efficacy in vitro at a time when no one had good predictive tests," said James F. Holland, M.D., professor of

hematology, medical oncology, and oncological sciences at Mount Sinai School of Medicine [2].

Indeed, Dr. Wright was one of the first researchers to analyze anticancer agents by comparing tissue-culture response to patient response [3, 4]. She developed new techniques for administering chemotherapy [5, 6, 7], and her strict attention to detail and concern for her patients helped determine effective dosing levels and establish treatment guidelines. She

treated patients that other physicians had given up on, and she was among the first small cadre of researchers to carefully test the effects of drugs against cancer in a clinical trial setting. Always seeking opportunities to share knowledge with her peers, she was among the seven founders of the American Society of Clinical Oncology, and the only woman.

Born in New York City on November 20, 1919, Dr. Wright was the first of two daughters of Dr. Louis Tompkins Wright, one of the first African-American graduates of Harvard Medical

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School, and elementary school teacher Corinne Cooke Wright. Her paternal grandfather, Dr. Ceah Ketcham Wright, was a graduate of Meharry Medical College, and her step-grandfather, Dr. William Fletcher Penn, was the first African-American to graduate from Yale Medical School.

Dr. Wright was educated in New York City at the Ethical Culture School and later the Fieldston School, graduating in 1938. She attended Smith College in Northampton, Massachusetts. After graduating from Smith in 1942, she attended New York Medical College, graduating with honors in 1945. She interned at Bellevue Hospital and completed her residency at Harlem Hospital, where she continued as a visiting physician while also working as a staff physician with the

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New York City Public Schools. In 1947, she married David D. Jones, Jr., a lawyer, and together they had two daughters, Dr. Alison Jones and Dr. Jane Wright Jones [8].

In 1949, she began working full time with her father, who had founded the Harlem Hospital Cancer Research Foundation a year earlier. Together, they tested different potential anti-cancer agents in tissue culture and in patients, an important contribution at a time when few guidelines for chemotherapy existed. They pioneered combination chemotherapy and conducted some of the first research on the administration of a series of chemotherapeutic drugs in a specific order [9].

They were among the first researchers to test triethylenemelamine, a nitrogen mustard-like chemical synthesized during World War II, in patients with cancer. Remissions were observed in patients with sarcoma, Hodgkin disease, and chronic myelogenous leukemia, mycosis fungoides, and lymphoma [10, 11]. They also performed early research into the clinical efficacy and toxicity of folic acid antagonists, documenting responses in 93 patients with various forms of incurable blood cancers and solid tumors [12]. Seven different folic acid antagonists were administered as single agents or in combinations, using various dosing and duration of treatment. Objective, although temporary, improvements were observed in 24 patients (including cases of sarcoma, leukemia, Hodgkin disease, metastatic breast cancer, metastatic prostate cancer, and metastatic cancer of undetermined origin) and 41 patients had subjective improvement. Among the 7 agents tested, aminopterin and amethopterin (methotrexate) appeared to be the most effective. This seminal 1951 paper provided the first evidence of the efficacy of methotrexate against solid tumors. Methotrexate continues to be used today for the treatment of a number of cancers, including breast, head and neck, lung, bladder, osteosarcoma, leukemia, and lymphoma. In a subsequent study, Dr. Jane Wright reported that methotrexate chemotherapy led to temporary objective tumor regressions in 10 out of 36 patients with incurable, disseminated breast cancer. Regressions were also seen in 8 out of 36 patients treated with triethylene thiophosphoramide (Thio-TEPA). Based on those findings, the authors recommended adding methotrexate and Thio-TEPA to radiation and hormonal therapy for patients with advanced disseminated breast cancer [13].

After her father died in 1952, Dr. Wright, at age 33, was named director of the foundation. Three years later, she joined the New York University Medical Center as an associate professor of surgical research and director of cancer chemotherapy research [8].

Dr. Wright was among the first researchers to systematically document the correlation between chemotherapy responses in patients and in primary tissue culture grown from biopsied samples collected from the same patients. In a 1957 paper published in the *New England Journal of Medicine*, she describes the correlation between clinical and in vitro responses to different chemotherapeutic agents in 40 cases of blood cancers and solid tumors [3]. The correlation was good in 26, equivocal in 4, and absent in 10 cases. The authors concluded that primary tissue culture might serve as a valuable method for screening and selection of the most effective chemotherapeutic agent for a given tumor in a given patient. This concept can be viewed as an early step towards personal-

ized medicine. In 1960, Dr. Wright and colleagues reported the successful regression of a form of skin cancer (mycosis fungoides) with the use of methotrexate [14].

Although many physicians discounted chemotherapy at the time, Dr. Wright was excited by the possibility of drug treatment and attended scientific conferences to learn as much as she could. She had joined the American Association for Cancer Research in 1954 and shared information with other researchers to learn how best to extend the lives of patients with cancer. It was the need for sharing information about this new field of cancer chemotherapy that brought seven physicians, including Dr. Wright, together in 1964 for lunch at the Edgewater Beach Hotel in Chicago. They discussed the need for a new medical society dedicated to the patient-oriented issues unique to clinical oncology. Dr. Wright served as Secretary-Treasurer of the newly formed American Society of Clinical Oncology (ASCO) from 1964 to 1967 and attended nearly every Annual Meeting of the Society since [15].

"Our goals were to bring about a set of standards for a clinical oncology specialty, to enlarge the area of knowledge in the field and to ensure that vital information was readily available and disseminated," Dr. Wright said in 2010 interview [16]. The ultimate goal was to bring into the specialty "a greater number of talented individuals who shared the goal of winning the battle against the ravages of cancer."

Also in 1964, President Lyndon B. Johnson named Dr. Wright to the President's Commission on Heart Disease, Cancer, and Stroke, chaired by Dr. Michael E. DeBakey. The commission's recommendations resulted in a national network of cancer treatment centers [8].

That same year, Dr. Wright described a method of using intra-arterial infusion through a catheter to deliver large doses of chemotherapy to tumors in the rectum, colon, cervix, pancreas, kidneys, skin, and other sites. The study suggested that chemotherapy could be infused through most major blood vessels in the body using this technique [17].

From 1966 to 1970, Dr. Wright served on the U.S. National Cancer Institute's National Cancer Advisory Committee, which became elevated to a Presidentially appointed advisory board under the National Cancer Act of 1971 [18].

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In 1967, Dr. Wright left NYU to take a position as associate dean and professor of surgery at New York Medical College. This made her the “highest ranked African American woman at a nationally recognized medical institution” at the time [8]. At the college, she formed a program for research in cancer, heart disease, and stroke. She also formed a program to teach doctors how to use chemotherapy, and she worked on the development of treatment guidelines. She became the first female president of the New York Cancer Society in 1971. She also led delegations of cancer researchers to China, Russia, Eastern Europe, and Africa.

Even with the demands of her career, she raised two daughters who also became medical professionals, one a clinical psychologist and the other a psychiatrist. “I am not sure that when I was growing up we realized exactly how on the cutting edge she was,” Dr. Alison Jones said. “She was always just a very, very busy mother because she took her work duties very seriously and she was a modest person. She didn’t boast about what she was doing” [1].

Dr. Wright retired in 1987, having authored 135 scientific papers and contributed to 9 books. She received many awards and honors, including the Smith Medal from Smith College, the Spirit of Achievement Award from Albert Einstein College of Medicine, and a lectureship in her honor by the American Association for Cancer Research.

In 2011, ASCO and the Conquer Cancer Foundation recognized Dr. Wright’s contributions to the field of oncology with the Jane C. Wright, M.D., Young Investigator Award. Martin J. Murphy, chair emeritus of the Conquer Cancer Foundation Board of Directors, said the early-career physicians selected for the award exemplify the high standards Dr. Wright set for the field: “They are following in her phenomenal footsteps, with tenderness toward patient care, with rigor towards scientific investigation, with focus that is always external and always on the patient” [19].

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Jane Cooke Wright with the recipients of the 2011 ASCO Young Investigator Award.

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