OBITUARY

Obituary: In Memory of Myron Flint Beal, MD, November 6, 1950–June 12, 2021

Myron Flint Beal, MD, passed away on June 12, 2021, in Manhattan at the age of 70, and he will be greatly missed. Dr. Beal was a University Professor of Neuroscience in the Feil Family Brain and Mind Research Institute at Weill Cornell Medicine, New York. He was an internationally recognized leader in neurology and neurodegenerative disorders and one of the most outstanding physician-scientists of his generation (Fig. 1).

Dr. Beal was born in London, England, on November 6, 1950, and grew up in New York. In 1972, he obtained his B.A. at Colgate University (Hamilton, NY). He received his MD from the University of Virginia (1976). He completed his neurology residency training followed by his postdoctoral fellowship program at the Massachusetts General Hospital—Harvard Medical School (Boston, MA). In 1984, he became an assistant professor of neurology and, in 1987, he was promoted to associate professor of neurology. He was a professor of neurology at Harvard from 1995 to 1998. Dr. Beal served as the chairman of the Department of Neurology and Neuroscience at Weill Cornell Medicine (1998–2012) and a neurologist-in-chief of the New York Presbyterian/Weill Cornell Medical Center.

Dr. Beal recruited leading neuroscientists to conduct outstanding research at Weill Cornell Medicine. He had an extraordinary knowledge in clinical neurology, and he made vital contributions to our understanding of basic neuroscience. He was renowned for his work in understanding the role of mitochondrial dysfunction and oxidative damage in the pathogenesis of neurodegenerative diseases and to test the efficacy of novel therapeutic interventions in animal models of these diseases. He developed a research team with extensive expertise in translational neuroscience.

Dr. Beal's studies initially concentrated on excitotoxicity as a disease mechanism in Alzheimer's disease (AD), as well as other neurodegenerative diseases. He then developed an interest in the role of mitochondrial dysfunction and oxidative damage. Over the past several years, Dr. Beal made extensive use of transgenic mouse models of neurodegenerative diseases, including AD. His laboratory developed a number of treatments, which have shown efficacy in improving the behavioral phenotype, increasing survival, and reducing neuropathologic damage in these transgenic mice. He utilized analytical chemistry techniques to measure alterations in neurochemistry, energy metabolites, and markers of free radical–mediated oxidative damage. He also utilized cell culture and cybrid approaches to assess mitochondrial and cell function in vitro.

Unusual for a single investigator, Beal extended his animal research to human patients. He developed neurochemical assays for measurements of neurotransmitters and oxidative damage markers in the cerebrospinal fluid (CSF), as well as plasma and CSF metabolomics to generate novel biomarkers for the diagnosis and assessment of treatment of amyotrophic lateral sclerosis (ALS), Parkinson's disease (PD), and Huntington's disease (HD). He led clinical trials to assess the efficacy of treatment with either coenzyme Q10 or creatine for the treatment of neurodegenerative diseases, including PD and HD.

Beal had an amazing track record with a sustained high productivity of outstanding publications, around 600 articles in peer-reviewed journals, which have been cited nearly 115,000 times and gives him an h-index of 157. Around 15 of his manuscripts have been cited more than 1000 times, and the review "Mitochondrial Dysfunction and Oxidative Stress in Neurodegenerative Diseases" published in *Nature* has received more than 5400 citations. He received a large number of national and international awards and honors for his exemplary achievements. Dr. Beal received the Derek Denny-Brown Neurological Scholar Award of the American Neurologic Association, and he served on the Council of the American Neurologic Association, Science Advisory Committees of the Hereditary Disease Foundation, Huntington's Disease Society of America, Parkinson's Disease Study Group, Parkinson's Disease Foundation, Bachman-Strauss Foundation, ALS Association, and the American Health Assistance Foundation. He was a member of the National Academy of

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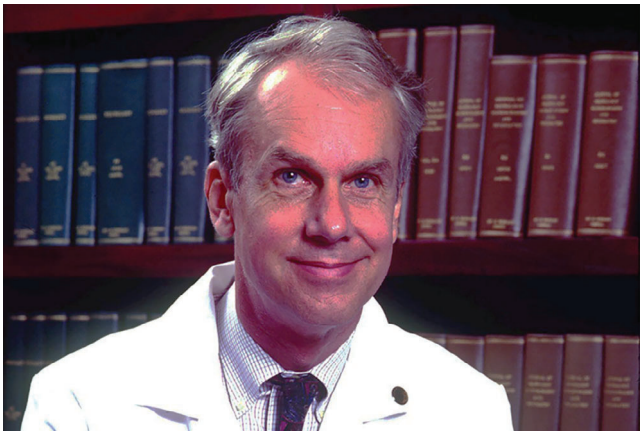

FIG. 1. Dr. Beal as a chairman of the Department of Neurology and Neuroscience at Weill Cornell Medicine (1998–2012), where he conducted research in neurodegenerative diseases. [Color figure can be viewed at wileyonlinelibrary.com]

Medicine. Moreover, he received the Honoris Causa Professor and Doctorate-University of Szeged.

Dr. Beal served as a mentor to a large number of junior faculty who have gone on to advanced positions, including endowed chairs, chairmanships of departments, and deans of medical schools. He served as an officer of the American Neurological Association (vice president) as well as an organizer of scientific symposia for the Society for Neuroscience, The New York Academy of Sciences, and the Alzheimer's Disease Association International Conference. He served as a senior associate editor of the *Journal of Neurochemistry* and *Annals of Clinical and Translational Neurology* as well as an editor and member of the editorial board of 17 other journals. He also served on the scientific advisory boards of numerous foundations supporting scientific research in neurodegenerative diseases.

Dr. Beal's most important achievements are as follows:

- To show that administration of inhibitors of the nitric oxide synthase, free radical scavengers, and coenzyme Q10 resulted in beneficial effects in an MPTP (1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine) mouse model of PD.
- Development of transgenic mouse models of PINK1 deficiency and a transgenic mouse with the R1441C mutation in LRRK2, which is related to PD in man.
- To use 3-nitropropionic acid to model HD in both rodents and cell lines.
- Development of several neuroprotective interventions to ameliorate survival and behavioral phenotype, improve mitochondrial function, and reduce pathology in different transgenic mouse models of neurodegenerative diseases.
- Development of neurochemical assays for the analysis of neurotransmitters and oxidative damage markers in plasma and CSF.
- To utilize cell culture and cybrid approaches to measure mitochondrial function, which led to research in human patients.
- Development of plasma and CSF metabolomics, assays using HPLC with coulometric array detection to generate novel biomarkers for the diagnosis and assessment of treatment of PD, AD, HD, and ALS.

Personally, Dr. Beal was kind, sensitive, friendly, funny, and interactive, and he had a perpetually positive spirit. He loved art and classical music. He was a devoted scientist, clinician, educator, and mentor. The clarity of his thinking and writing was remarkable. He was able to simplify complex issues in an extraordinary manner. Although he was beset by a variety of medical problems, none sapped his energy for long. He inspired great loyalty from his numerous trainees and philanthropists. He has left an indelible mark on both Weill Cornell Medicine and the New York Presbyterian Hospital.

We are saddened by the loss of one of the finest scientists in the world. Dr. Beal is survived by his former wife Judy and their children Bradley and Emily; his four sisters; his four grandchildren; and a host of devoted colleagues, students, and collaborators, now spread across the world.

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