Pediatric RESEARCH

INSIGHTS

Charles E. Ahlfors (1944–2020)

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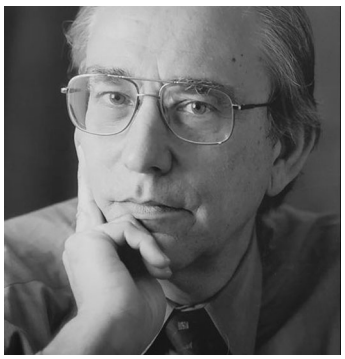

On 19 March 2020, the pediatric community lost a great scientist, teacher, innovator, friend, and generous colleague after a 3-year struggle with cancer.

Chuck Ahlfors combined his background in chemistry, biology, and neonatology to become a leader in the field of newborn jaundice research, with major contributions to the measurements of "free" bilirubin (Bf) and albumin binding and modeling their applications to the care of infants with hyperbilirubinemia.

Chuck graduated with honors from San Jose State University with a B.A. in Chemistry/Biology before receiving an M.D. degree at the Stanford University School of Medicine. He completed his pediatric training at the Cleveland Metropolitan General Hospital, followed by a fellowship in neonatology at the University of California, Davis. He remained at UC Davis for 14 years, becoming Chief of the Division of Neonatology from 1985 to 1988. In 1988 he accepted a position as Chief of the Division of Neonatology at California Pacific Medical Center in San Francisco where he remained until 2002, leaving to head Research and Product Development for LW Ligand, LLC. There he engaged in designing a zone fluidics instrument to measure Bf while continuing collaborative research around the world. From 2006 until his death, Chuck was Consulting Professor in the Division of Neonatology and Developmental Medicine in the Department of Pediatrics at Stanford University.

During his neonatology fellowship he was introduced to the peroxidase method for measuring Bf, and applied his chemistry background to make two critical improvements in the assay: (1) using two concentrations of peroxidase to mitigate errors in calculating Bf, and (2) adjusting for the effects of plasma dilution on Bf. His passion and dedication to understand the transport, body distribution, and toxicity potential of bilirubin dominated his career. He strongly advocated for incorporating the law of mass action into jaundice management thinking, writing several pivotal review papers explaining lucidly how bilirubin interacts with albumin and how it is distributed between plasma and tissue. Throughout his career, he collaborated with many investigators around the world, helping them to master the Bf (peroxidase) assay for clinical and laboratory investigations. He established and conducted the method at the Stanford University, and supported several national and international collaborative clinical studies. He was one of "the Five Yellow Knights" who met yearly to brainstorm ideas to unravel unsolved mysteries of bilirubin chemistry, transport, and toxicity. In his last project, he spearheaded the design of a prototype device that measures total bilirubin and Bf in a patient's serum before and after adding additional bilirubin. The two-point titration evaluates the quality of binding by determining an apparent binding constant. The quality of binding is then compared with data from a cohort of newborns with similar "risk criteria," thus identifying the patient's "relative risk" for an adverse event.

Chuck's intellectual prowess was matched by a steadiness in character, a wonderful sense of humor, and deep caring for his patients and colleagues. Above all, he was a family man; his greatest priority was being with his wonderful wife Carol, two daughters, and two grandchildren for whom he wrote two very creative and entertaining books. Some colleagues even had the pleasure of witnessing his mastery of the accordion and guitar. He will be greatly missed, but not forgotten. His legacy will be the lasting contributions he has made to science and technology, sustained by the many investigators he has influenced and mentored.

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