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Foreword

A new journal in the field of child biochemistry

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The definition of the term "pediatric biochemistry" has broadened over the past 130 years. As clinician scientists, focused on child health issues, have developed tools to examine the biology and chemistry of child health and disease, the scope of the armamentarium of the pediatric biochemist is both more pervasive and more mechanistic. The pediatric biochemist of the 21st century publishes the results of his/her efforts in journals of increasing specialization. Despite this, there exists a need for a general journal of the biochemical features of children. *The Journal of Pediatric Biochemistry* meets that need. To understand from whence biochemistry has come, a historic overview is appropriate.

The year 2010 marks the centennial of a famous report by Abraham Flexner that revolutionized medical education in the United States and spread out to the world. Among the reforms recommended by Flexner were that real associations between schools of medicine and universities be forged so that students of medicine would be educated in the basic life sciences of medicine. These reforms in medical education consolidated scholarly activities around several themes, among which were an emphasis on child health and the chemistry of biologic processes, or biochemistry. In truth, centers for child health and insights into biochemistry predated 1910, particularly in children's hospitals in Europe in the 1880's, where clinicians worked in laboratories examining blood and urine and measuring ions and proteins in body fluids.

A huge biochemical problem between the 1880's and 1920's was the profound acidosis that accompanied infantile diarrhea and dehydration. Just as compelling was the challenge of understanding nutritional biochemistry. Two landmark discoveries were the appreciation that bicarbonate was lost in diarrhea fluid, and that a series of nutrients, termed vitamins, were needed in the diets of all humans, particularly growing children. Pediatric biochemists between 1910 and 1940 were focused on electrolyte chemistry and physiology and on nutritional studies, especially in animal models using young, growing animals. As an example, the discovery of vitamin D and its addition to certain diets resulted in the curing and prevention of nutritional rickets and osteomalacia.

In the post-World War II era, the application of antibiotic therapy cured many infections and prevented suppurative consequences. Likewise, the essentials of a balanced diet were better understood and dietary deficiency conditions became uncommon. Only when the infections and the pervasive deficiency disorders were somewhat controlled did the phenotypes of rare conditions become clear. As nutritional rickets disappeared, the hereditary phosphaturias became evident.

In the second half of the 20th century, pediatric biochemistry became the science of microanalysis of the substrates and products of intermediary metabolism, the role of DNA in heredity, and the delineation of bio-

chemical processes at a cellular and molecular level. Advances in technical capacity and analytic techniques led to scientific discoveries of the nature of the gene, of genetic regulation of biochemical processes, and analysis of molecular structure and signaling pathways.

During the last three decades, greater understanding of inborn errors of metabolism and transport and the widespread use of genetic screening of populations for hitherto fatal illnesses has remarkably expanded the number of genetic disorders of man. The deployment of enzymes that cut DNA and RNA, methods to unravel signal transduction pathways (such as antibody probes), the discovery of signaling molecules and the use of PCR technology have led to these insights. Moreover, the human genome project and its byproducts have permitted gene-wide searches and genomic approaches to gene-gene interactions.

The challenge for the pediatric biochemist of the 21st century is to recognize the vast array of resources available through unlocking the human genome (and those of other species), the rapidly changing process of measuring metabolites, transcription factors and proteins, and an information technology scene in which billions of pieces of data can be analyzed and cross-referenced. It is an exciting time to start a new journal.