In November 2008, the Department of Biological Chemistry at Johns Hopkins School of Medicine celebrated its 100th birthday, making it one of the oldest departments of its kind. The event was marked with a symposium featuring six distinguished guest scientists, followed by a gala banquet attended by several hundred friends and associates. The department has enjoyed a century of remarkable accomplishments by its faculty and leaders, including many “firsts” (and with many significant connections to ASBMB) that are in keeping with the great traditions of Johns Hopkins University.

The Medical Department (which eventually became the Medical School) at Johns Hopkins University in Baltimore, Maryland opened its doors in 1893 under the combined leadership of four giants in the field of medicine: William Welch (pathology), William Halsted (surgery), William Osler (medicine), and Howard Kelly (gynecology). Among the innovative ideas that characterized the department’s new curriculum was the teaching of chemistry to the medical students. This was originally to have been done by the Department of Chemistry, but it was ultimately entrusted to John Jacob Abel, professor of pharmacology. Abel, who later founded the *Journal of Biological Chemistry* in 1905 and the American Society of Biological Chemists (which eventually became ASBMB) in 1906, had a lifelong interest in the chemistry of biology and certainly would have been influential in making this decision. In the words of Welch, who was the first dean of the medical school:1 “Physiological chemistry means much more than what is usually taught in our medical schools as medicinal chemistry, which includes little more than the chemical analysis of certain fluids of the body for diagnostic purposes.”

This statement demonstrates the increasingly popular and much broader view, particularly as had been enunciated by Felix Hoppe-Seyler, one of the pioneers in the development of biochemistry, that to truly understand the molecular basis of physiology, it was essential to understand the underlying basic chemistry.

Abel, with the aid of several assistants, took up the task of teaching physiological chemistry to the medical students as a separate course (but not as a separate department) for the next several years. One of these individuals was Walter Jones, a native Marylander, who obtained his Ph.D. in chemistry from Johns Hopkins. He had joined Abel as an assistant in 1896 and rose to associate and then associate professor, all in physiological chemistry. In 1908, Jones was promoted to professor. This event was accompanied by the formation of the Department of Physiological Chemistry and the naming of Jones as its director (the title used for chair). In 1923, as the result of an unusual bequest from Capt. Joseph DeLamar, who was not a chemist and had no direct connection with Johns Hopkins University, the position was endowed, and Jones and all subsequent directors have held the title of DeLamar Professor. (The accompanying $4 million gift did not, however, find its way into the departmental coffers.)

Jones worked most of his life on nucleic acids, in particular, the enzymes that modified the bases. He developed this interest during a short stay in Germany in the laboratory of Albrecht Kossel, who, following in the footsteps of Friedrich Miescher, had become one of the leaders in this field. During this time he met and became close friends with Phoebus A. Levene, who was also an important contributor to the field of nucleic acid research. Levene, like Jones, was a founding member of the *JBC* and the Society. Jones eventually became the eighth president of the ASBC (1915–1916). He passed away in 1935.

One of the more impressive aspects of the history of the department, which changed its name to the Department of Biological Chemistry in 1984, is that, including Jones, there have only been five directors in its 100-year history, two of whom are still active there. In 1927, Jones retired,
Over the past 100 years, there have only been five directors of the Department of Physiological Chemistry (Biological Chemistry) at the Johns Hopkins School of Medicine: (left to right) Walter Jones, William M. Clark, Albert L. Lehninger, M. Daniel Lane, and Gerald Hart.

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Clark was succeeded as director by the third DeLamar professor, Albert L. Lehninger. Lehninger, who was born in 1917, trained at the University of Wisconsin and spent six years at the University of Chicago before moving east. During his tenure there, he made seminal discoveries concerning fatty acid oxidation (some with his student, Eugene P. Kennedy, who became the 47th president of the ASBC in 1970) and the involvement of ATP that led to the appreciation that cellular metabolism was compartmentalized. Lehninger went on to make great contributions to the understanding of oxidative phosphorylation and energy-coupling with electron transport and the role of the mitochondrion in respiration, energy metabolism, and the regulation of calcium distribution in cells and tissues. However, to several generations of biochemists, Lehninger is probably best known for his textbook, Principles of Biochemistry, that was widely adopted and was one of the most heavily used in medical and graduate teaching for many years. Perhaps reflecting his early collegiate interest in English, he authored several other books on the mitochondrion and bioenergetics that were equally authoritative. Lehninger was the 49th president of the ASBC (1972). He stepped down from his position at Johns Hopkins in 1978 and passed away in 1982.

The fourth director of the department was M. Daniel Lane, a native of Chicago. Unlike his predecessors, he had been recruited to the department several years before taking over as director and was thus an internal appointment. Lane received his doctorate from the University of Illinois in 1956 and held faculty positions at Virginia Polytechnic Institute and State University in Blacksburg, Virginia and July 2009

Clark was essentially a physical chemist and protested at the time of his appointment as director that “[h]e had had no formal training in biochemistry, had an inadequate appreciation of the needs of medical students, and [had] inherited laboratory equipment and space totally deficient for my research and student instruction.” The latter problem was soon corrected, and he quickly rectified his lack of knowledge in biochemistry and medical instruction. He proved to be an outstanding teacher and leader and held the post of director until 1952. However, he continued as emeritus DeLamar professor and as a research professor in chemistry until his death in 1964. He was the 18th president of the ASBC (1933–1934).
New York University before moving to Johns Hopkins in 1970. He served as director and DeLamar Professor from 1978 to 1997. He is presently the Distinguished Service Professor in the department. Lane continued the tradition of excellence in both research and teaching set by his predecessors. His own work has focused on understanding the molecular basis of fatty acid synthesis and adipogenesis and their relationship to obesity and other conditions, including the nature of differentiative processes in adipocytes. He is also a world leader in insulin signaling and the mechanisms underlying diabetes. He served as the 67th president of the ASBMB (1990).

The department is currently headed by Gerald Hart, the fifth director and DeLamar Professor. Hart received his doctorate from Kansas State University and was a post-doctoral fellow in the department at Johns Hopkins under William J. Lennarz (the 66th president of the ASBMB, just before Lane), where he contributed significant detail to the understanding of the formation of \(N\)-linked carbohydrates. In 1992, he moved to the University of Alabama at Birmingham as chair of biochemistry and molecular genetics but eventually returned to Johns Hopkins to assume the directorship in 1997. Hart is best known for his discovery of \(O\)-linked \(N\)-acetylglucosamine (\(O\)-GlcNAc), an intracellular modification of proteins on serine and threonine residues. This modification is clearly related to a variety of metabolic and disease conditions and will likely form the basis of important cellular regulation mechanisms.

Today’s department is a varied group of outstanding investigators that reflects the expansion and diversification of biochemistry as a discipline. This was manifested in the birthday symposium, entitled “The Biology of Molecules, the Chemistry of Life,” where presentations on Wnt signaling (Marc W. Kirschner, Harvard Medical School), centromeres (Don Cleveland, University of California, San Diego), cell motility (Thomas D. Pollard, Yale University), small RNRs (Joan A. Steitz, Yale University), prion proteins (Susan Lindquist, Massachusetts Institute of Technology), and insulin action (C. Ronald Kahn, Harvard University) were featured. By its nature (and title), the symposium emphasized the founding principles of Abel and the subsequent directors (and their many faculty colleagues) that were and are focused on the chemistry of biology.

The ASBMB and Johns Hopkins University Department of Biological Chemistry have enjoyed common origins and purposes throughout their 100-year histories. As both head into their second century, one can expect this close and productive relationship to continue.

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REFERENCES