Have you ever wondered how the simplest and smallest element in the known universe could lead to “a brighter, more intellectual, and healthier way of living”? In *Hydrogen Molecular Biology and Medicine*, Xuejun Sun, Shigeo Ohta, and Atsunori Nakao (2015) endeavor to answer that very question and more by creating the first book in the field of hydrogen biology and medicine. The three editors have carefully arranged chapters addressing topics and concepts concerning hydrogen absorption and release, the biological safety of hydrogen, detection techniques as well as the selective anti-oxidative effects of hydrogen. In the final chapters, the editors weigh in on numerous application methods from drinking hydrogen-rich water to skin-smearing and bathing. The final chapter strongly closes with opinions on the future course of hydrogen research.

With the goal of creating “the hydrogen bible” it is only fitting that the leading experts and modern founders of the field, Sun, Ohta, and Nakao would collaborate together. Professor Sun is a top hydrogen researcher in China and was first contracted by Springer Science and Business Media in 2013 to create this book. Sun has previously published *Hydrogen Molecular Biology* in Chinese (selling over 10,000 copies) and has contributed to about 20% of all the articles relating to the hydrogen research field. Professor Ohta is regarded as one of the earliest pioneers and founder of modern hydrogen research since he and his group made several substantial contributions to molecular hydrogen research, which includes an iconic *Nature Medicine* article published in 2007. Professor Nakao, one of the earliest hydrogen researchers in the United States, has also advanced hydrogen research with the initial studies concerning the usage of hydrogen in organ transplant protection at the Department of Surgery in the University of Pittsburgh. Nakao now contributes to the hydrogen field in the clinic as well as with hydrogen research studies in Japan. Sun and Ohta also assist John H. Zhang, Editor-in-Chief of *Medical Gas Research* (MGR), and others as editors and creators of MGR which is the first journal dedicated to medical gases. Sun and Zhang date back for many years, Sun studied at the Zhang laboratory and published hyperbaric oxygen and hydrogen studies there as early as 2010. In addition, Sun has continued on establishing the Chinese Hydrogen Biology Association and participated in the formation of other hydrogen foundations.

One strength noticeable throughout the book is that Sun, Ohta, and Nakao have a very strong knowledge base of hydrogen research and were able to compile and collect quality information concerning each topic from a variety of authors and sources. Although multiple writers and input from several sources is a strength, at times the blending of different writing styles from an assortment of authorities and non-native English writers can be difficult for some scientists and casual readers. The book could benefit from a more careful editing into standard English, making a better reading experience for all. Nevertheless, the editors overcome this limitation with strong and engaging content, especially in the chapters regarding the selective anti-oxidative and therapeutic effects of hydrogen.

In the early chapters, the writers have adeptly outlined some of the details that led to hydrogen research inquiries. Both the familiar and unacquainted readers would find this information interesting and even entertaining at times. Generally, the origins of modern medical hydrogen research are similar to most fields of research, beginning with a basic observation in nature followed by the development of hypotheses. The surprising elements come from the facts and anecdotes, ranging from TV documentary series to descriptions of multiple mind-boggling medical miracles. Others may also be intrigued to read examples of how popular
culture and seemingly improbable events deemed to be nonscientific could lead to substantial biomedical research. The information located in the middle of the book is more technical and scientifically based. These sections provide information regarding endogenous production, diffusion, conductivity, saturation, and heat capacity of hydrogen. The writers also expertly delve into the safety and toxicity on hydrogen relaying findings from diving medicine research containing information of how hydrogen affects the respiratory system, the circulatory system, and the gastrointestinal system. In addition, detailed descriptions of several detection methods of hydrogen such as the various techniques involving gas chromatography, oxidometry, and rheophore detection are analyzed and discussed too.

A comprehensive classification of the components of reactive oxygen species (ROS) combined with thorough characterizations of how an imbalance of ROS can lead to oxidative stress and injury can also be gained from reading this book. Furthermore, the reader can find descriptions of studies where hydrogen therapy has played roles combating oxidation, inflammation, and apoptosis in many diseases.

In the final portions, the editors generate ideas about barriers to hydrogen therapy research and translation as well as where the field of hydrogen biology and medicine is headed next. Although hydrogen therapy has been demonstrated in more than 60 animal models and 6 human diseases with reports of minimal or no side effects, specific details concerning the correct amount, frequency, and timing of dosage still requires further investigation. The editors also suggest that remaining research should be more focused around the molecular mechanism of action, dose-response in the clinical setting, double-blinded randomized clinical trials, biological systems testing, and the study of similar gas molecules.

With this first book, Sun, Ohta, and Nakao have definitely laid the foundation for a brighter outlook on the field of hydrogen biology and medicine. Scientists, hydrogen industrialists, and other enthusiasts alike can expect more research and furtherance in the area of hydrogen.

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