

# JMMB: Continuing a Tradition of Basic and Applied Scientific Advances

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This issue of JMMB, Vol. 2 No. 1, the first to appear in the new millennium, focuses on a single topic, that of microbial alcoholic fermentation. This topic has been, is and will continue to be of immeasurable historic, scientific and industrial importance. The early study of alcoholic fermentation very substantially contributed to the identification and characterization of microbes and enzymes as well as to early recognition of the fact that cellular metabolism has a firm chemical basis. Fermentation microbiology continues to advance at an ever-increasing rate, thanks in part to the genomics revolution. I here present a brief historical synopsis of the field in order to put the current issue of JMMB in perspective.

In 1810, Gay-Lussac demonstrated that the equation:  $C_6H_{12}O_6 \leftrightarrow 2C_2H_5OH + 2CO_2$  accounted for the fermentation of glucose to ethanol and carbon dioxide, and twenty-seven years later, Cagniard-Latour, Schwann and Kützing showed that the phenomenon of alcoholic fermentation required the participation of live yeast cells. Based on these discoveries, Pasteur subsequently made important advances concerning the biological, chemical and pathological properties of microbes. Of particular importance to the topic of microbial fermentation was his observation in 1861 that production of alcohol from glucose does not require molecular oxygen. Pasteur termed the process "la vie sans air". He further showed that anaerobic glucose metabolism generates lactate, butyrate, succinate and glycerol in addition to ethanol, and surmised that aerobic organisms possessed the capacity for anaerobic fermentation. Over the next 100 years, the essential biological universality of the process that Gay-Lussac and Pasteur had studied gradually became established.

The systematic study of enzymes began in 1897 when Buchner first obtained a cell-free extract that converted glucose to ethanol. Meyerhof demonstrated that extracts of mammalian muscle catalyzed the anaerobic degradation of glycogen to lactate using a similar degradative pathway. The process of alcoholic or lactic acid fermentation soon became equated with anaerobic glycolysis, and an understanding of these two related processes developed in parallel. These events marked the birth of molecular microbiology and biochemistry and led to appreciation of the view that at least at the biochemical level, all living organisms are more similar than different. These early

notions led to our current recognition, based on nucleic acid and protein sequence data, that all living organisms on Earth are related.

Today, the study of microbial fermentation is as alive and well as in the days of Pasteur and Meyerhof. In this issue of JMMB, a series of minireviews and original research articles dealing with a variety of related basic and applied aspects of current fermentation research are presented. The volume was organized by Christian Schuster of the Technical University of Vienna who, together with Peter Dürre of the University of Ulm, one of the five JMMB Senior Editors, and several outside reviewers, provided the editorial review of the research articles included. We therefore have Christian Schuster and Peter Dürre to thank for the exciting and timely compilation of articles that comprise the meat and substance of the current issue of JMMB.

The sixteen review and research articles included in JMMB Vol. 2 No. 1 focus on the topic of microbial fermentation. Both basic and applied aspects of current research are covered in greater depth and range than had been possible in a single previously published journal volume. Dr. Schuster and his colleagues have put together a collection of papers that will undoubtedly prove to be a valuable reference source for many years to come. They are to be congratulated.

The birth of JMMB in 1999 depended on the active participation of many esteemed scientists. These include the contributors who prepared the scientific materials presented as well as the network of JMMB editors, including the Senior Editors, members of the editorial board and a large number of outside reviewers. I wish to personally thank all of these individuals for their dedicated participation that has helped to make JMMB a viable, much-needed and up-and-coming force in the scientific community, serving both the basic and applied segments of the microbiological community. Names of the Senior Editors and members of the current editorial board can be found on the cover page of each JMMB issue, and their efforts are gratefully acknowledged. The many outside reviewers are listed below, and their contributions are also most gratefully acknowledged.

As noted in previous issues of the journal, JMMB hopes to provide an expressional platform for a large segment of the microbiological scientific community. Bioinformatics, Biosystematics, Biotechnology, Functional Genomics, Proteomics and Transcriptome Analyses are among the many areas we aim to emphasize. We look forward to receiving your contributions in these and other established and up-coming areas of basic and applied microbiology and biotechnology.

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