

What's up with Bergey's?



Barney Whitman

Bergey's Manual Trust
Department of Microbiology
University of Georgia
Athens GA 30602-2605 USA
Tel (1) 706 542 4219
Fax (1) 706 542 2674
Email whitman@uga.edu

This spring, the last volume of the 2nd edition of *Bergey's Manual of Systematic Bacteriology* (BMSB) has been submitted to the publisher, with an expected publication date of late 2011 or early 2012. This multivolume work describes the systematics, ecology, physiology and other biological properties of prokaryotes. Published by Bergey's Manual Trust and Springer, it is the most complete and authoritative description of bacterial and archaeal diversity currently published.

Work on the second edition of BMSB began in 1998 and represented the combined efforts of 21 editors and about 900 authors from all over the world, including at least 30 authors from Australia. It comprises five volumes. Volume 1 was published in 2001 and includes 165 genera that are assigned to the domain *Archaea* and some of the deeply-branching phyla of the *Bacteria*, especially the phototrophs. Volume 2 was published in 2005 and includes descriptions of 425 genera assigned to the phylum *Proteobacteria*. Volume 3 was published in 2009 and includes

descriptions of 235 genera belonging to the phylum *Firmicutes*. Volume 4 was published in early 2011 and includes descriptions of 198 genera of the phyla *Bacteroidetes*, *Spirochaetes*, *Tenericutes* (Mollicutes), *Acidobacteria*, *Fibrobacteres*, *Fusobacteria*, *Dictyoglomi*, *Gemmatimonadetes*, *Lentisphaerae*, *Verrucomicrobia*, *Chlamydiae*, and *Planctomycetes*.

The last volume, Volume 5, should be in print at the end of 2011. It will encompass the *Actinobacteria*, which includes streptomycetes and many other industrially important microorganisms as well as many severe pathogens such as *Corynebacterium diphtheriae* and *Mycobacterium tuberculosis*. In this volume, the editors propose elevating the subclasses and suborders in the current classification of the phylum *Actinobacteria* to classes and orders, respectively. Thus, the volume will include the description of six classes, 23 orders, 61 families and 220 genera. Important to note are the contributions of our dedicated managing editor Aidan Parte, the copy editors Susan Andrews, Joanne Auger, Robert Gutman and Judy Leventhal, and Linda Sanders, our administrative assistant at the University of Georgia, for making the last three of these volumes possible.

The second edition is built upon a series of road maps or phylogenetic analyses of the 16S rRNA genes. The first two volumes used the road maps constructed by Garrity and Holt¹ and Garrity *et al.*². The subsequent volumes elaborated upon the original road maps using the 16S rRNA gene trees constructed by Wolfgang Ludwig and his collaborators at the SILVA rRNA database project. These very detailed trees relied upon the much expanded databases of 16S rRNA gene sequences that became available in the last five years. The phylogenetic trees and



Figure 1. Trustees of Bergey's Manual Trust and editors of Volume 5 at the Trust meeting in Sevilla, Spain, 11 May 2010. Front row (left to right): Ken Suzuki (editor), Peter Kaempfer (trustee and editor), Karl Schleifer (emeritus trustee), Michael Goodfellow (trustee and editor), Jim Staley (emeritus trustee); Back row: Paul De Vos (trustee), Juergen Busse (editor), Barney Whitman (trustee and editor), and Martha Trujillo (editor). The famous Torre del Oro watchtower is in the background. Missing are editor Wolfgang Ludwig, managing editor Aidan Parte, and trustee Fred Rainey.

taxonomic outlines are available along with the road maps at the Bergey's website: www.bergeys.org

This is where we are, but where are we going? At the last Bergey's Manual Trust meeting in Sevilla, Spain, the trustees and editors of Volume 5 met to discuss the future direction after completion of the second edition of *Bergey's Manual of Systematic Bacteriology* (Figure 1). At this time, it was noted that the manual quickly goes out of date after it is published. Because the isolation and description of new prokaryotes is rapidly proceeding in laboratories worldwide, a third edition of BMSB is needed to keep pace with this growing understanding of prokaryotic life. On average, greater than 110 genera and 600 species have been described in the scientific literature in each of the last five years. Upon completion of the second edition, BMSB will contain descriptions of only 1243 of the 1861 genera known at the beginning of 2010. Part of the reason for this low coverage is that the content of Volume 1 is now more than 10 years old and needs to be updated. For example, only 65% of the currently described genera in the phylum *Euryarchaeota* are included in Volume 1. In addition, there has been very rapid discovery and characterisation of novel organisms in some groups, and many recently covered taxa are also now incomplete. A particularly extreme example is the phylum *Bacteroidetes*, where only 75% of the currently named genera were included in Volume 4 when it was completed last year. Lastly, even for well-known genera, new information that is suitable for inclusion in BMSB is continually being discovered. Thus, there is ample scientific justification for a third edition.

To address some of the problems encountered in publication of the second edition, Bergey's Manual Trust seeks to electronically publish the third edition. This goal will address two of the factors affecting the second edition. It will provide content in the manner expected by many modern readers and will avoid the lengthy delays in publication resulting from the difficulty in coordinating large numbers of authors. Currently, a volume can only be completed when the last author is done. For Volume 3, manuscripts were received over a period of five years, from 2004 to 2008. Many manuscripts received in 2004 were rewritten two or three times to remain current with the tardiest authors. In the electronic publication, manuscripts will be published shortly after they are received. With this goal in mind, the Trust is currently negotiating with publishers.

In 2010, the Trust facilitated the formation of a new society, Bergey's International Society for Microbial Systematics (BISMiS). The objectives of the society are to promote the highest standards of scientific research in microbial systematics, to support the study of microbial diversity in order to understand the complexity and diversity of microbial life, to promote the global production and dissemination of scientific knowledge about microbial systematics through publications, conferences, specialist meetings, workshops and written reports, and to support efforts to enhance the education of all peoples regarding current knowledge about microbial systematics and diversity.

More information on the society is available on our website www.bergeys.org

Pale, male and stale? Perhaps with some justification, the Trust has been criticised for being insular, out of touch and out of date. However, recognising the problems is the first step in the process of fixing them, and the Trust is currently working hard to better represent the entire microbiology community. For instance, the first meeting of the Bergey's International Society for Microbial Systematics will be held in Beijing on 19–23 May 2011, to provide better opportunities for our Asian colleagues to participate. Sponsored in part by Bergey's Manual Trust, the Chinese Society for Microbiology, the Institute of Microbiology of the Chinese Academy of Sciences, and the North China Pharmaceutical Group Corporation, the conference is entitled *Microbial Systematics: Concepts, Practices and Recent Advances*. The opening ceremony will include a keynote lecture by Barry Sharples, Nobel Prize Laureate (Scripps Institute, USA). The conference will address the latest developments in microbial systematics and diversity, systematics of microbial eukaryotes, the impact of microbial diversity on biotechnology, archaeal systematics, and biosystematics and bioinformatics. Notable speakers include Antonio Ventosa (University of Seville, Spain, and winner of the 2010 Bergey's Award), Aharon Oren (The Hebrew University of Jerusalem, Israel), Martha Trujillo (University of Salamanca, Spain), Luis A Maldonado (Universidad Nacional Autónoma de México), Xiuzhu Dong (Institute of Microbiology, Beijing, China), Wenjun Li (Yunnan Institute of Microbiology, Kunming, China), Paul Jensen (University of California, San Diego, USA), Iain Sutcliffe (Newcastle University, UK), and Peter Kämpfer (Justus Liebig University, Giessen, Germany), and many more. More information is available on the website www.bismis.org. Our thanks to Lixin Zhang and his organising committee for all their hard work in making this meeting possible!

References

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2. Garrity, G.M., *et al.* (2005) The Revised Road Map to the *Manual*. In *Bergey's Manual of Systematic Bacteriology* (2nd edn) vol. 2, The *Proteobacteria*, Part A, Introductory Essays (Brenner *et al.*, eds), pp. 159–220, Springer, New York.

Biography

Barney Whitman received his PhD in Microbiology from the University of Texas, Austin, in 1978 and he received postdoctoral training at the University of Illinois, Urbana, prior to joining the University of Georgia in 1982. He presently holds the rank of Professor and Head of Microbiology. His research focuses on the physiology and systematics of environmentally important prokaryotes. His current projects include studies of the H₂ and sulphur metabolism of the methane-producing archaeon *Methanococcus* and dimethylsulfoniopropionate metabolism by the marine alpha-proteobacterium *Ruegeria*. Other research focuses on the responses of bacterial communities in soil and marine sediments to man-made perturbations, such as agriculture, as well as natural seasonal variations.