Minutes

P. Kuhnert, *Secretary*
H. Christensen, *Chairman*

International Committee on Systematics of Prokaryotes

Subcommittee on the taxonomy of the *Pasteurellaceae*

Minutes of the meetings, 25 July 2005, San Francisco, CA, USA

Session 1 – Closed meeting

Minute 1. Call to order. The closed meeting was held on 25 July 2005, in room 230 at the Moscone Convention Centre, San Francisco, CA, USA. The Chairman, H. Christensen, opened the meeting at 14:00.

Minute 2. Record of attendance. The members present were H. Christensen (Chairman), P. Kuhnert (Secretary), H.-J. Busse, T. Inzana and R. Mutters. Apologies were received from M. Bisgaard, P. Blackall, R. Davies, W. Frederiksen, O. Gaillot and M. Kilian.

Minute 3. Approval of agenda. The agenda was circulated electronically. No additional points were made to the agenda.

Minute 4. Last subcommittee meeting. H. Christensen explained that the last meeting of the Subcommittee on the *Pasteurellaceae* had been held on 30 July 2002 at the IUMS conference in Paris but minutes had not been prepared from that meeting. A main decision from the meeting had been to circulate important matters of the subcommittee to its members by email. In addition, new prospective members were suggested (see below).

Minute 5. Changes in membership and election of officers. During 2004, prospective members were elected by email and a new Chairman and Secretary were nominated for the subcommittee. This correspondence was initiated by the former Chairman, F. Dewhirst, and the former Secretary, M. Bisgaard. New members elected were T. Inzana, R. Davis, O. Gaillot, P. Kuhnert and H. Christensen. H. Christensen and P. Kuhnert were elected as Chair and Secretary, respectively. Both Chair and Secretary agreed to continue for one more term. Upon the election of a new Chairman, F. Dewhirst retired from the subcommittee. The subcommittee members thanked the former Chairman and Secretary for their much appreciated work. Two other members retired from the subcommittee, W. Frederiksen and M. Kilian. H. Christensen expressed the gratitude of the subcommittee and gave an extraordinary thank you to W. Frederiksen for his work on the subcommittee. Dr Frederiksen was a key person in

taking the initiative to establish the subcommittee in 1981 and held the position of Secretary until 1994. The members regretted that M. Kilian decided to withdraw from the subcommittee, but expressed their great thanks to him for his contribution and for the work he has done for the subcommittee since 1982. At the end of 2004, N. Nørskov Lauritsen (Århus, Denmark) was selected as a prospective member and full membership has now been confirmed by the subcommittee.

Minute 6. Current membership. The current membership of the subcommittee is as follows: H. Christensen (Copenhagen, Denmark) (Chairman), P. Kuhnert (Bern, Switzerland) (Secretary), R. Mutters (Marburg, Germany), M. Bisgaard (Copenhagen, Denmark), H.-J. Busse (Wien, Austria), P. Blackall (Moorooka, Australia), T. Inzana (Blacksburg, VA, USA), R. Davies (Glasgow, UK), O. Gaillot (Rennes, France) and N. Nørskov Lauritsen (Århus, Denmark).

Minute 7. Minimal standards. It was decided to establish a working group consisting of H.-J. Busse, M. Bisgaard, P. Kuhnert and H. Christensen to define minimal standards for the description of novel taxa within the family. A basis for this should be the article by Christensen *et al.* [*Int J Syst Evol Microbiol* 51 (2001), 2221–2225], as well as articles describing minimal standards in other taxa, e.g. *Flavobacteriaceae*. Inclusion of housekeeping genes, the role of genomics, host-specificity and commercial identification systems were discussed. The draft established by this group will be confirmed by the other members of the subcommittee before publication. H.-J. Busse emphasized that the minimal standards should be really ‘minimal’ in setting up guidelines for classifying and naming of novel species and he also emphasized that the minimal standards are only guidelines. R. Mutters mentioned the importance of having methodology-independent minimal standards to account for changes in methodology. H.-J. Busse recommended two sections of minimal standards, one with true minimal standards independent of methodology and another with more detailed examples of current methods.

Minute 8. Next meeting. It was discussed whether formal subcommittee meetings should be held at IUMS meetings or at the ‘*Pasteurellaceae* Conference’ (former HAP meetings). Argument for the latter is contact with the largest

group of researchers within the *Pasteurellaceae* (T. Inzana). For the former, the IUMS conference provides the best contact with taxonomists within other bacterial groups (H.-J. Busse). It was decided to continue to have the formal meetings at the IUMS and informal meetings at the 'Pasteurellaceae Conference'.

M. Bisgaard proposed by email that there should be an informal subcommittee meeting in Europe within the next year. In addition, he suggested that a monograph could be prepared from such a meeting, similar to the monographs published from the Copenhagen (1981) and Prague (1989) meetings. It was decided to work on a distinct concept for such a monograph. It was agreed that there is a need for such a book because of the many changes currently and recently seen within the *Pasteurellaceae* and that it should focus on the taxonomy of lesser known members. The principles used for classification and nomenclature could be outlined in more detail and included in such a book. T. Inzana announced that a book from the American Society for Microbiology is planned with a focus on pathogenic members of the *Pasteurellaceae*.

Minute 9. Varia. The subcommittee confirmed that decisions could be taken by email and that this means of communication could be used formally by the subcommittee. However, all important correspondence exchanged this way should be summarized in the minutes of the ICSP Subcommittee meetings.

Minute 10. Adjournment. The closed meeting was adjourned at 15:30 on 25 July 2005.

Section 2 – Open meeting

Minute 11. Call to order. The open meeting was held on 25 July 2005 in room 230 at the Moscone Convention Centre, San Francisco, CA, USA. The Chairman, H. Christensen, opened the meeting at 15:45.

Minute 12. Record of attendance. The members attending the closed meeting also attended the open meeting. In addition, the meeting was attended by B. Bruun (Hillerød, Denmark).

Minute 13. Use of housekeeping genes for classification of members of the *Pasteurellaceae*. P. Kuhnert presented an overview on the use of 16S rRNA, *rpoB* and *infB* gene sequences for phylogenetic analysis of the *Pasteurellaceae*. After that, the use of the three genes *recN*, *rpoA* and *thdF* for investigating DNA–DNA relatedness within the family was described (manuscript in preparation).

The use of these three genes and the application of the formula published by Zeigler [Int J Syst Evol Microbiol 53 (2003), 1893–1900] on *Mannheimia* species gave a good correlation between DNA–DNA reassociation and housekeeping gene similarity, with a general overestimate by the sequence-based method. The use of *recN* alone also showed a good correlation. For example, the preliminary limits for species and genus delineation using the new method were 85 % and around 40 %, respectively, and application of the new method for the genus *Actinobacillus* indicates genus level separation of *Actinobacillus minor* from *Actinobacillus sensu stricto*. The three gene sequences could also be used to compare DNA G+C content. A comparison of all the data gained by conventional methods such as DNA–DNA reassociation and HPLC was discussed and it was suggested that the new sequence-based method should be used in the future.

In the discussion of the use of DNA–DNA reassociation, H.-J. Busse said that the rule used by IJSEM editors was that with more than 97% 16S rRNA gene sequence divergence between strains, DNA–DNA hybridizations were not needed [Stackebrandt & Goebel, Int J Syst Bacteriol 44 (1994), 846–849].

Minute 14. Status of genome sequencing in the *Pasteurellaceae*. T. Inzana summarized the genome sequencing efforts within the family *Pasteurellaceae*. Genome sequences are increasingly used in taxonomy. The publicly available genomes (available through the home pages of TIGR, MICROGEN, NCBI, Baylor College of Medicine Human Genome Sequencing Center and DOE Joint Genome Institute) were mainly in three categories, those finished (*Haemophilus influenzae*, *Histophilus somni*, *Pasteurella multocida*, '*Mannheimia succiniciproducens*'), those closed but not fully annotated (one strain of *Haemophilus influenzae*, one strain of *Pasteurella multocida*, *Actinobacillus actinomycetemcomitans*, *Haemophilus ducreyi*, *Histophilus somni*) and the ones not yet closed (one strain of *Haemophilus influenzae*, strains of *Actinobacillus pleuropneumoniae*, one strain of *Histophilus somni*). T. Inzana mentioned that the genome of the urogenital bovine isolate 129PT of *Histophilus somni* is very different from that of the respiratory bovine isolate 2336. H. Christensen regretted the lack of genome sequences of type strains of the species. T. Inzana replied that most type strains are passaged many times in culture and their genome sequences have changed compared with field strains. The information from these strains would not be useful to investigate disease mechanisms.

Minute 15. Adjournment. The open meeting was closed at 17:00 on 25 July 2005.