

CoMiCProN Guidelines on Bacterial Nomenclature

Preamble

The *Ad Hoc Committee for Mitigating Changes in Prokaryotic Nomenclature (CoMiCProN)* was formed in early 2024 by a group of medical and veterinary researchers and practitioners and taxonomic nomenclature experts under the auspices of the *International Committee on Systematics of Prokaryotes (ICSP)*. The ICSP sets the rules by which prokaryotes are named. The Ad Hoc Committee is concerned with changes in the naming of bacteria that occur in databases and publications. The (increasing) number of bacterial name changes has serious implications for, among other fields, medical microbiology. As one of the remedies envisaged by the Ad Hoc Committee, this document provides guidelines on bacterial nomenclature.

Key aspects of the ICNP for mitigating name changes

The following information may be particularly relevant to key resources for clinical microbiologists, such as journals and databases (note that, as above, all terms in official use are italicised the first time they appear):

- (1) The vast majority of bacterial name changes apparently perceived as mandatory by databases, editors, reviewers, authors, agencies or practitioners are actually not mandatory according to the official regulations regarding prokaryotic nomenclature as implemented in the *International Code of Nomenclature of Prokaryotes (ICNP)*.
- (2) The vast majority of bacterial name changes are due to changes in taxonomic opinion. Even if these newer taxonomic opinions take the form of new bacterial names that are *validly published* and *legitimate* under the ICNP, this alone does not imply any formal obligation to adopt the more recently proposed names if their older counterparts are also validly published and legitimate, as it is usually the case.
- (3) Newer opinions on taxonomic classification, i.e. how organisms are grouped, are not better than older opinions just because they are newer. Of course, newer taxonomic studies tend to be based on more data than previous studies. However, not all changes in taxonomic opinion can be inferred from the data. Newer data may allow the application of taxonomic concepts that could not be applied in the past, but this does not always mean that the newer concepts are obligatory according to the data. The newer concepts are often a deliberate but optional choice of the publishing authors.
- (4) Even if a newer taxonomic classification were to be preferable from a purely taxonomic point of view, there may be practical reasons for postponing its application. While there is some cost associated with any kind of change, there is a much more serious problem with changing the names of prokaryotes of practical relevance. The crucial issue is that older names may be bound by regulations, legal or otherwise, while their newer counterparts are not – or not yet. And some of these regulations have serious implications for health care.

For these reasons, the Ad Hoc Committee wishes to emphasise the importance of scientific journals and databases not giving the impression, or inadvertently perpetuating the perception, that newer names of prokaryotes must always be used in place of their older counterparts. If the older names

are validly published and legitimate they may still be the *correct name* of a taxon according to the ICNP.

The importance of being precise about the rules of nomenclature

Therefore, we would like to communicate how journals and databases can improve medical practice in bacterial nomenclature. Let us look at an example of how bacterial nomenclature issues can be presented in a way that avoids the problems listed above. The *List of Prokaryotic names with Standing in Nomenclature* (LPSN) is a frequently consulted resource on how to name bacteria in full compliance with the ICNP. On [one of its taxon pages](#) we recognize two important points.

Firstly, LPSN does not automatically treat the last validly published and legitimate name – among several *homotypic synonyms* – as the correct name. For example, *Borrelia burgdorferi* (Johnson et al. 1984) Adeolu and Gupta 2015 is a *new combination* (of the species epithet *burgdorferi* with a new genus name, *Borrelia*) and therefore a more recent name than *Borrelia burgdorferi* Johnson et al. 1984. However, LPSN currently considers the latter to be the correct name.

Secondly, LPSN emphasizes that there is no obligation to follow their taxonomic preference. One of the notes on this LPSN page states:

“*Borrelia burgdorferi* is the correct name instead if this species is regarded as a separate species (i.e., if its nomenclatural type is not assigned to another species whose name is validly published, legitimate and not rejected and has priority) within a separate genus *Borrelia*.”

In other words, the choice of which name to use – among several validly published and legitimate homotypic synonyms – depends on taxonomic opinion. In the example considered here, the choice is between seeing *Borrelia* as a genus separate from *Borrelia* or seeing *Borrelia* as a *later heterotypic synonym* of *Borrelia*. Such a choice may well be made by the end users of taxon names.

Once a name is validly published, it remains validly published and available for use, with extremely rare exceptions. Since what must be considered the correct name of a taxon may depend on taxonomic opinion, we discourage the use of terms that give the impression that names have been officially replaced or updated.

Authors of a paper may, of course, express their own taxonomic opinion. However, it is important to make it very clear in review articles on bacterial nomenclature that changing a validly published and legitimate name to a more recent new combination depends on such a taxonomic opinion, even if this newer name is also validly published and legitimate. We therefore discourage the use of terms, such as “former name” and “revised name”, as such wording suggests that the former name should no longer be used. However, the ICNP makes no mention of this.

The importance of not rushing to call for names to be rejected

The misconception that the last validly published and legitimate name – among several homotypic synonyms – must be treated as the correct name sometimes leads authors to ask the Judicial Commission of the ICSP to place bacterial names on the list of rejected names (*nomina rejicienda*). This is in stark contrast to the interpretation of the *Judicial Commission* of the ICSP – the only body that can reject a prokaryotic name. In the [most recent overview](#) by the Judicial Commission we find the following statement:

“Care must be taken to not confuse taxonomic controversies, which may well arise from reclassifications ..., with issues of nomenclature Only the latter should be brought to the attention of the Judicial Commission. Neither the ICNP nor the Judicial Commission rule on taxonomy ..., and Requests which regard the rejection of names as a means of solving taxonomic disputes ... need to be denied Issues regarding the correct name of a taxon that only reflect distinct taxonomic views ... should be directed elsewhere”

In other words, precisely because there is no formal obligation to adopt the most recent validly published and legitimate name among several homotypic synonyms as the correct name, no formal action is required (or even possible) to revoke that effect.

Biological nomenclature is a dry and abstract subject, and most microbiologists, health professionals and veterinarians deal with taxon names on a daily basis without being aware of the rules underlying the generation and use of these names. Yet taxon names have a profound impact on the way researchers and practitioners do their work. There are certainly some real issues associated with nomenclature, but there are also many practical problems that could be avoided simply by promoting the accurate interpretation and presentation of the rules associated with prokaryotic names.

How journal editors and database curators can help

We therefore ask the editors of journals and the curators of databases devoted to medical microbiology to help us by ensuring that the editors and curators, and thus the readership of these journals and databases, are aware of the points (1) to (4) above. In particular, we ask that editors and curators take steps to clarify that the last validly published and legitimate name of a prokaryotic taxon – among several homotypic synonyms – need not automatically be treated as the correct name. This includes

- (a) not forcing authors of scientific articles to treat names in this way;
- (b) avoiding the publication of articles and database entries that give this impression;
- (c) encouraging authors to list the synonyms, if any, of a taxon name the first time it is mentioned in an article, including the abstract;
- (d) encouraging authors to give preference, among names for the same taxon that conform to the ICNP, to the one that is best recognised in regulations that have implications for health care;
- (e) avoid recommending formal action by the Judicial Commission or other bodies of the ICSP when there is no need to do so.

Editorial boards may wish to consider including such recommendations in their journal's Instructions for Authors. We believe that such an action would be much more effective than another publication reiterating these issues. The basics of bacterial nomenclature have been explained many times, as illustrated below.

How editors and reviewers could be taxonomically conservative

The ICNP is not a code of taxonomy and guarantees “freedom of taxonomic thought or action”. Similarly, CoMiCProN does not intend to interfere in the proposal of names.

However, in terms of criteria for taxonomic studies themselves, we would like to emphasise that reclassifications are better justified if they (conservatively) resolve instances of non-monophyly, rather than, for example, splitting an already monophyletic genus into smaller monophyletic genera. Examples of this are the splitting of *Mycobacterium* and *Borrelia*, which we would caution against.

Journal editors and reviewers may wish to consider this when dealing with taxonomic manuscripts. Of course, databases do not have to treat the last validly published name as the correct name anyway. (This is one of the issues we highlighted above.) However, if someone as an editor or reviewer wanted to help mitigate changes, they could well be taxonomically conservative using the suggestion above. Editors and reviewers are encouraged to contact CoMiCProN if they have any further questions.

Final comments

We hope that these guidelines will help journal editors, database curators and scientific authors to better understand and address the confusions and misunderstandings arising from the misapplication of the ICNP. Links to freely available information on the issues raised here are provided below.

*The ICSP Ad Hoc Committee for
Mitigating Changes in Prokaryotic Nomenclature,
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Appendix

For more information on the term “correct name” and related issues please consult:

- [Misunderstanding the bacteriological code](#)
- [Why and how does LPSN assign the status “correct name”?](#)
- [LPSN glossary entry on the term “correct name”](#)
- [Life talk on these topics on YouTube](#)
- [On validly published names, correct names, and changes in the nomenclature of phyla and genera of prokaryotes: a guide for the perplexed](#) (see page 2, right column)
- [Evidence of taxonomic bias in public databases: The example of the genus *Borrelia*](#)
- [Guidelines for interpreting the International Code of Nomenclature of Prokaryotes and for preparing a Request for an Opinion](#) (see Sections 2, 4, 6)
- [Preparation of the Validation Lists and the role of the List Editors](#) (IJSEM Editorial)
- [International Code of Nomenclature of Prokaryotes. Prokaryotic Code \(2022 Revision\)](#)
- [International Committee on Systematics of Prokaryotes Frequently Asked Questions](#)
- [Minutes of the meetings of the Ad Hoc Committee on Mitigating Changes in Prokaryotic Nomenclature](#)