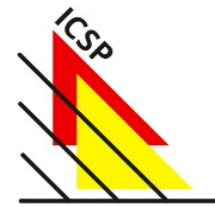


ICSP Frequently Asked Questions (FAQ)



International Committee on
Systematics of Prokaryotes

Preamble

Here we have compiled answers to questions about the activities of the International Committee on Systematics of Prokaryotes (ICSP). Please visit the pages of the ICSP website [<https://the-icsp.org/>] for information on specific topics and please check the “ICSP Matters” section of the International Journal of Systematic and Evolutionary Microbiology (IJSEM) to keep up to date with the committee’s activities.

Executive Board of the ICSP

Changelog

- FAQ approved in the meeting of the ICSP Executive Board (ICSP-EB) on 27th October 2022
- minor changes made in subsequent e-mails and some minor formal modifications for the purpose of generating a PDF
- next version approved in the ICSP-EB meeting on 30th March 2023
- minor additions made afterwards
- new section “Does the inclusion of a name in a Validation or Notification List mean that this is the name to be used for a taxon?” included in version 15
- minor additions made afterwards

The ICSP in general

What is the purpose of the ICSP?

The ICSP is the international body that governs the nomenclature of prokaryotes. Nomenclature is concerned with how groups of organisms (taxa) are named, whereas taxonomy is concerned with how organisms are arranged into such groups in the first place. The ICSP does not govern taxonomy. Subcommittees of the ICSP may publish minimal standards for the description of new taxa of prokaryotes but these are non-binding recommendations. Scientific journals may have their own requirements for publishing descriptions of taxa.

See also:

- ICSP Statutes [<https://dx.doi.org/10.1099/ijsem.0.003117>]
- ICSP website [<https://www.the-icsp.org/>]

How does the ICSP operate?

The ICSP is responsible for publishing the International Journal of Systematic and Evolutionary Microbiology (IJSEM). The International Code of Nomenclature of Prokaryotes (ICNP) as well as the Validation Lists are published in the IJSEM. The Judicial Commission of the ICSP publishes Judicial Opinions on nomenclatural issues, which rule on matters of dispute submitted to it (as a 'Request for an Opinion'). The ICSP Subcommittees on Taxonomy publish recommendations (minimal standards) for the description of new taxa in selected groups of prokaryotes. The ICSP and its subcommittees publish minutes of their meetings in the IJSEM or on the ICSP website. For details, please see the ICSP Statutes and the "ICSP Matters" section of the IJSEM.

See also:

- IJSEM [<https://www.microbiologyresearch.org/content/journal/ijsem>]
- ICSP website [<https://www.the-icsp.org/>]

What is the difference between the ICSP and the ICNP?

The International Code of Nomenclature of Prokaryotes (ICNP) is one of the major products of the ICSP. The ICNP is not a committee but a set of General Consideration, Principles and Rules that govern the nomenclature of prokaryotes. Most ICSP decisions that affect nomenclature are decisions about emendations of the ICNP. The only other kind of ICSP decisions that affect nomenclature are decisions to ratify Judicial Opinions, but these do not override the ICNP.

See also:

- ICSP Statutes [<https://dx.doi.org/10.1099/ijsem.0.003117>]
- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]

Who does the ICSP represent?

The ICSP has a statutory responsibility to "represent the diversity of interests of different microbiological disciplines on matters concerning the nomenclature of prokaryotes". Its membership is defined in its Statutes. As a subsidiary of the International Union of Microbiological Societies (IUMS), each member society of the Bacteriology & Applied Microbiology (BAM) Division of the IUMS can send a delegate to the ICSP. The ICSP may also co-opt members in order to represent the international community of microbiologists more broadly. The ICSP constantly strives to increase its membership, but the outcome also depends on the willingness of societies to join the IUMS (and then nominate delegates) and on the willingness of individuals to serve on the committee.

Interested members of an ICSP member society that does not have a delegate to the ICSP are encouraged to volunteer by contacting their society secretary. Alternatively, those interested in being co-opted onto the ICSP can contact the ICSP Chair or Secretary for further information.

See also:

- ICSP Statutes [<https://dx.doi.org/10.1099/ijsem.0.003117>]
- IUMS [<http://www.iums.org/>]

Can I join the ICSP?

There are several ways to get involved. To become a voting member of the ICSP, please see above. To submit nomenclature-related proposals or to participate in ICSP debates, please see below.

See also:

- ICSP Statutes [<https://dx.doi.org/10.1099/ijsem.0.003117>]

Is the ICSP democratic?

Yes, it is. For example, its decisions on nomenclature are based on a majority vote of the voting members of the ICSP. For the composition of the voting members of the ICSP, see above. For the discussions that precede an ICSP decision, see below. Detailed information on the underlying regulations can be found in the ICSP Statutes. In addition, there are many matters that the ICSP does not even attempt to decide, such as taxonomy. The ICSP is authoritative on certain issues, but not authoritarian.

See also:

- ICSP Statutes [<https://dx.doi.org/10.1099/ijsem.0.003117>]
- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]

Is the ICSP transparent?

Yes, it is. Forthcoming decisions on nomenclature are announced well in advance in the “ICSP Matters” section of the IJSEM or on the ICSP website. The reasons for each nomenclature proposal are published together with the proposal. The results of these decisions will also be announced in the IJSEM. Subcommittees of the ICSP also publish minutes of their meetings, either in the IJSEM or on the ICSP website.

See also:

- ICSP Statutes [<https://dx.doi.org/10.1099/ijsem.0.003117>]
- IJSEM [<https://www.microbiologyresearch.org/content/journal/ijsem>]

Is the ICSP open?

Yes, it is. Nomenclature debates are publicly announced as explained above. Nomenclature debates are also held in public prior to the subsequent ICSP vote. Previously, such debates were conducted through open e-mail exchanges. As of 2021, the ICSP will use an open channel on the Slack platform to conduct such debates.

See also:

- ICSP Statutes [<https://dx.doi.org/10.1099/ijsem.0.003117>]
- IJSEM [<https://www.microbiologyresearch.org/content/journal/ijsem>]
- Slack [<https://icnp-revision.slack.com>]

Does the ICSP listen?

Yes, it does. Anyone can publish formal nomenclature-related proposals in the IJSEM, such as a proposal for an emendation of the ICNP, and anyone can contribute to an open debate of the ICSP

and present factual arguments for or against a proposal under consideration. You do not need to be a voting member of the ICSP to influence an ICSP decision. In fact, most contributions to recent ICSP open debates have been made by participants who are not voting members of the ICSP.

Numerous changes made to the ICNP throughout its existence demonstrate that it had always been possible to adapt it to new circumstances, to criticize its shortcomings and to derive improvements in its wording from such criticism. However, working on nomenclature-related regulations requires time and effort to familiarize oneself with the current wording of the ICNP and its interpretation.

See also:

- ICSP Statutes [<https://dx.doi.org/10.1099/ijsem.0.003117>]
- IJSEM [<https://www.microbiologyresearch.org/content/journal/ijsem>]
- Slack [<https://icnp-revision.slack.com>]

Who can make proposals related to nomenclature?

Anyone can submit proposals for nomenclature-related changes, either as proposal for modifying the ICNP, or as a Request for an Opinion to be dealt with by the Judicial Commission. For the sake of transparency, such proposals must be published in the IJSEM, as required by the ICSP Statutes. The peer review of manuscripts submitted to the IJSEM is organized by the journal. The ICSP Statutes ensure that sufficient time is allowed for discussion of such proposals before a decision is made.

See also:

- ICSP Statutes [<https://dx.doi.org/10.1099/ijsem.0.003117>]
- IJSEM [<https://www.microbiologyresearch.org/content/journal/ijsem>]

Are ICSP decisions final?

The processing of a particular proposal to emend the ICNP does indeed end with the vote of the voting members of the ICSP on that proposal and the subsequent publication of the result. However, alternative proposals related to rejected proposals can be made at any time in the future and may shed new light on the issues to be decided.

See also:

- ICSP Statutes [<https://dx.doi.org/10.1099/ijsem.0.003117>]
- IJSEM [<https://www.microbiologyresearch.org/content/journal/ijsem>]

The ICSP and taxonomy

Does the ICSP regulate taxonomy?

No. Important disciplines within systematics are classification, identification and nomenclature. The term taxonomy is often used as a synonym for systematics, although the ICNP treats taxonomy like classification, and therefore separate from nomenclature.

The ICSP publishes the ICNP, and the ICNP regulates nomenclature but not classification or identification. Classification is concerned with grouping organisms; nomenclature is concerned with

assigning names to organisms, given the grouping. Subcommittees of the ICSP may publish minimal standards for the description of new prokaryotic taxa, but these are non-binding recommendations.

See also:

- ICSP Statutes [<https://dx.doi.org/10.1099/ijsem.0.003117>]
- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- Guidelines for interpreting the ICNP [<https://dx.doi.org/10.1099/ijsem.0.005782>]
- LPSN nomenclature page [<https://lpsn.dsmz.de/text/nomenclature>] (not an official ICSP publication)
- Explanatory article [<https://doi.org/10.1038/s41522-024-00494-9>] (not an official ICSP publication)

What is the role of the lists published in the IJSEM?

For a taxon name to be recognized by the ICNP, it must be published in the IJSEM. Taxon names do not have to be proposed directly in the IJSEM; they can be published elsewhere (this is called effective publication) and then included in a Validation List to become validly published. (It should be noted that there are some basic criteria that must be met for taxon names to become validly published). The IJSEM also contains Notification Lists, which provide an overview of names published directly in the IJSEM. Lists of Changes in Taxonomic Opinion and *Candidatus* Lists are also published in the IJSEM. These lists do not affect the status of taxon names in the ICNP, but are provided as a service to the community.

See also:

- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- IJSEM [<https://www.microbiologyresearch.org/content/journal/ijsem>]
- Role of the List Editors [<https://doi.org/10.1099/ijsem.0.003106>]

Does the ICSP approve or deny taxon names?

No. The ICSP publishes the ICNP, and the ICNP regulates which names of prokaryotes have a claim to recognition under the ICNP. The ICNP also regulates which name must be used for a given taxonomic group according to its rules, and under what conditions. The IJSEM list editors can only refuse to include a name on an IJSEM Validation List if it violates the rules of the ICNP. The Judicial Commission of the ICSP may place a name on the list of rejected names, but this is done rarely, in very specific circumstances, and requires a Request for an Opinion. The ICSP does not control, nor attempt to control, the mere proposal of a taxon name.

See also:

- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- IJSEM [<https://www.microbiologyresearch.org/content/journal/ijsem>]
- Role of the List Editors [<https://doi.org/10.1099/ijsem.0.003106>]
- Guidelines issued by the Judicial Commission [<https://dx.doi.org/10.1099/ijsem.0.005782>]

Does the inclusion of a name in a Validation or Notification List mean that this is the name to be used for a taxon?

No. Notification Lists do not affect the status of taxon names in the ICNP anyway, but are provided as a service to the community. Inclusion of a name in a Validation List is part of the requirements for valid publication of a name whose effective publication is not in the IJSEM. Indeed, some of these names may, in time, be considered later synonyms, or it may be proposed to transfer the organisms to another genus, thus necessitating the creation of a new combination. Conversely, it may be proposed to transfer an organism back to an earlier genus and to consider the basonym or an earlier new combination to be the correct name, rather than a more recent new combination. The ICNP does not decide on such taxonomic opinions.

Notification Lists indicate which names originating from an effective publication in the IJSEM itself have been validly published, but Notification Lists are neither a necessary nor a sufficient condition for a name to be validly published. Inclusion in a Validation List is a necessary condition for a name to be validly published if it originates from an effective publication outside the IJSEM.

When there are several validly published and legitimate names for a taxon, the choice of the correct name depends on the circumscription, position and rank of the taxon. Rank is implicit in the taxonomic category of the name, which in turn is implicit in a validly published and legitimate name. However, circumscription and position are matters of taxonomic opinion on which the ICNP does not rule. Therefore, the inclusion of a name in a Notification or Validation list does not necessarily mean that it is the correct name for a taxon.

See also:

- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- Role of the List Editors [<https://doi.org/10.1099/ijsem.0.003106>]
- Guidelines issued by the Judicial Commission [<https://dx.doi.org/10.1099/ijsem.0.005782>]
- Article explaining the term “correct name” [<https://doi.org/10.1099/00207713-49-3-1313>] (not an official ICSP publication and slightly outdated)
- More recent explanatory article [<https://doi.org/10.1038/s41522-024-00494-9>] (not an official ICSP publication)
- LPSN FAQ page [<https://lpsn.dsmz.de/text/faq#why-and-how-does-lpsn-assign-the-status-correct-name>] (not an official ICSP publication)
- LPSN Glossary [<https://lpsn.dsmz.de/text/glossary#correct-name>] (not an official ICSP publication)

Does the ICSP propose taxon names?

No. Taxon names are proposed by individual taxonomists. Some members of the ICSP are also active in taxonomy, but when doing so they act as individual taxonomists and not as members of the ICSP. Having different roles does not in itself create a conflict of interest. Rather, an active taxonomist may be more likely to become aware of nomenclatural issues and report them to the ICSP. The ICSP regulates nomenclature mainly through the publication of the ICNP, and the ICNP is explicitly dedicated to ensuring taxonomic freedom.

See also:

- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- IJSEM [<https://www.microbiologyresearch.org/content/journal/ijsem>]
- Clarification of the role of the ICSP [<https://doi.org/10.1038/s41579-022-00706-z>]

Does the ICSP hinder anyone proposing taxon names?

No. Scientific journals may have their own requirements for publishing descriptions of microbial taxa but, with the exception of the IJSEM, these journals are independent of the ICSP. The ICSP publishes the ICNP, and the ICNP regulates which taxon names have claim to recognition under its rules. However, this does not mean that a taxon name that does not (yet) have claim to recognition under the ICNP cannot be proposed. On the contrary, the proposal of a taxon name in a publication is a prerequisite for obtaining a claim to recognition under the ICNP. The ICSP does not control, nor does it attempt to control, the mere proposal of a taxon name.

See also:

- ICSP Statutes [<https://dx.doi.org/10.1099/ijsem.0.003117>]
- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- Clarification of the role of the ICSP [<https://doi.org/10.1038/s41564-022-01167-z>]

Does the ICSP replace taxon names by others?

No. Taxon names intended to replace other taxon names may be proposed by individual taxonomists. In most cases, this is done by proposing new combinations to reflect the placement of a species in a different genus (or, less commonly, the placement of a subspecies in a different species). Users of taxon names are free to use either the older or the newer name in such cases, depending on their taxonomic view of the classification. The same applies to databases, i.e. curators can choose which name they prefer. Even if the proposal of a taxon name is intended to replace a name that does not conform to the ICNP, this is done by individual taxonomists, not by the ICSP. The ICSP does not control or attempt to control the adoption of taxon names by third parties, although it may attempt to clarify which names are consistent with the ICNP and which are not.

See also:

- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- IJSEM [<https://www.microbiologyresearch.org/content/journal/ijsem>]
- Guidelines issued by the Judicial Commission [<https://dx.doi.org/10.1099/ijsem.0.005782>]

Does the ICSP change the spelling of taxon names?

No. The ICNP regulates what orthographic or grammatical corrections can be made to the spelling of a taxon name, and by whom. Corrections to the spelling of a taxon name are proposed by individual taxonomists or by the IJSEM List Editors. The ICNP provides clarity as to whether such corrections are in accordance with its rules. In case of doubt about a spelling, a Request for an Opinion can be sent to the Judicial Commission of the ICSP.

See also:

- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- IJSEM [<https://www.microbiologyresearch.org/content/journal/ijsem>]
- Guidelines for writing a Request for an Opinion [<https://dx.doi.org/10.1099/ijsem.0.005782>]

Are nomenclature-related regulations published by the ICSP impractical or confusing?

No. The ICNP is very similar to the ICNafp (International Code of Nomenclature for algae, fungi, and plants, also known as the Botanical Code), from which it is historically derived. Most of the key concepts are the same, including valid publication, legitimacy and correctness of names. The ICZN (International Code of Zoological Nomenclature) uses different terms, but shares many concepts with the ICNafp and ICNP. A large number of names have been validly published (ICNafp, ICNP) or made available (ICZN) under all three codes and all three codes regulate the use of these names.

Most microbiologists come into contact with prokaryotic taxon names before they are aware of the actual rules that govern the creation and use of these names. Users of taxon names may therefore make inferences about nomenclature based on how certain databases, non-official publications or other sources handle taxon names. If such inferences later come into conflict with the actual rules, this does not mean that the actual rules are confusing or otherwise deficient.

See also:

- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- ICNafp [<https://www.iapt-taxon.org/nomen/main.php>]
- ICZN [<https://code.iczn.org>]
- Guidelines issued by the Judicial Commission [<https://dx.doi.org/10.1099/ijsem.0.005782>]

Is knowledge of Latin required to propose taxon names?

No. In the ICNP, taxon names are treated as Latin, but this does not mean that taxon names have to correspond in part or in full to known Latin words. In the ICNP, it must be possible to treat a taxon name as if it were Latin, but a taxon name can also be formed arbitrarily. There are a number of fairly simple approaches to taxon name formation that can be used by anyone. Instead of learning Latin, it is almost always sufficient to study the relevant sections of the ICNP, such as Appendix 9, to form taxon names according to the ICNP. Moreover, there are many commonly used and well-known Latin or Greek components of taxon names that can easily be reused by any taxonomist. Of course, if someone wanted to express something sophisticated in a taxon name, a deeper knowledge of Latin (or Greek) would be required. But this is natural, and the ICSP does not force anyone to be sophisticated in this respect. In addition, the IJSEM has nomenclature reviewers who can give expert advice on naming.

See also:

- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- Forming names [<https://dx.doi.org/10.1093/femsle/fnaa096>]
- Nomenclature reviewers [<https://www.microbiologyresearch.org/content/journal/ijsem?page=editorial-board>]

- LPSN etymology page [<https://lpsn.dsmz.de/text/etymology>] (not an official ICSP publication)

Why are taxon names treated like Latin?

One reason for using Latin word components is that these components do not change in meaning, as Latin is a (nearly) dead language. Forming all taxon names in such a way that they have a Latin "look and feel", even if the names are actually formed arbitrarily, has the even greater advantage that most taxon names are fairly easily recognised as taxon names even if you have not seen them before. Being able to easily distinguish taxon names from the surrounding text is very helpful when dealing with scientific literature. Last but not least, all three major nomenclature codes (botanical code - ICNafp, zoological code - ICZN, microbiological code - ICNP) treat taxon names as Latin, and have done so for more than a century. For this reason, consistency alone dictates that this practice should continue.

See also:

- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- ICNafp [<https://www.iapt-taxon.org/nomen/main.php>]
- ICZN [<https://code.iczn.org>]

What is a nomenclatural type good for?

Taxon names proposed in accordance with the ICNP have a nomenclatural type. Although called "type", the nomenclatural type need not be typical or representative of its taxon. The purpose of a nomenclatural type is to be permanently attached to a taxon name. (Elsewhere the nomenclatural type is called a "name-bearing type" or "nominifer", which fits well). This is necessary to clarify which name should be used in certain situations and to reflect certain taxonomic views, e.g. when a taxon is split or two taxa are merged. The use of nomenclatural types is particularly elegant in the case of taxa above the rank of genus, whose names are derived from the name of their nomenclatural type (or the nomenclatural type of their nomenclatural type). Thus, the regularly formed name of each taxon above genus rank directly indicates the only genus that is guaranteed to be contained within the taxon above genus rank. In the case of the ICNP, since January 2001, the nomenclatural type of a species or subspecies must be a strain available to others for taxonomic study, which is important for replication and comparison purposes.

See also:

- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- ICNafp [<https://www.iapt-taxon.org/nomen/main.php>]
- ICZN [<https://code.iczn.org>]
- Guidelines for interpreting the ICNP [<https://dx.doi.org/10.1099/ijsem.0.005782>]

Is the ICNP only for cultured prokaryotes?

No. General Consideration 5 clearly states that it applies to all prokaryotes. While it is true that Rule 30 requires the deposition of type strains in two culture collections, the same Rule has a note explaining how and when exceptions can be applied. It should not be forgotten that many species

and subspecies names were validly published before 2001 under the more flexible wording of Rule 30 and these names have not lost validity even if they have no cultured representative.

It should also be stressed that as-yet-uncultivated taxa can be named as *Candidatus* taxa under the provisions described in Appendix 11 of the ICNP. Although this is only a provisional status (i.e. it doesn't confer a name with standing in the nomenclature), *Candidatus* names are a useful addition to the names validly published under the ICNP.

See also:

- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- Advantages of *Candidatus* names [<https://doi.org/10.1099/ijsem.0.005000>] (not an official ICSP publication)
- Scope of the ICNP [<https://dx.doi.org/10.1099/ijsem.0.005754>]
- Proposal for further integration of *Candidatus* names into the ICNP [<https://doi.org/10.1099/ijsem.0.006188>] (not an official ICSP publication)
- Explanatory article [<https://doi.org/10.1038/s41522-024-00494-9>] (not an official ICSP publication)

The ICSP and phylum names

Did the ICSP replace phylum names?

No. Names of phyla could not be validly published under the ICNP until 2021, when the rank of phylum was introduced into the ICNP. This was followed by the valid publication of 42 phylum names by Oren & Garrity, who were acting as individual taxonomists in this case. It was entirely up to them how many phylum names they included in their publication. The 42 validly published phylum names have counterparts that have been in the literature for some time, but are not validly published under the ICNP and have no standing in nomenclature. Most of these are very similar in spelling to the validly published phylum names. Notably, Oren & Garrity attributed the validly published phylum names to the authors of the non-validly published counterparts who did the taxonomic work. Göker & Oren did the same for four other phylum names in 2023.

See also:

- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- Introduction of phylum category [<https://dx.doi.org/10.1099/ijsem.0.004851>]
- Valid publication of 42 phylum names [<https://doi.org/10.1099/ijsem.0.005056>] (not an official ICSP publication) and Notification List [<https://doi.org/10.1099/ijsem.0.005165>]
- Juxtaposition of new and old names on LPSN [<https://lpsn.dsmz.de/text/names-of-phyla>] (not an official ICSP publication)
- Explanatory article [<https://doi.org/10.1038/s41522-024-00494-9>] (not an official ICSP publication)
- Juxtaposition in Judicial Opinion 129 [<https://doi.org/10.1099/ijsem.0.006064>]

- Valid publication of *Cyanobacteriota* [<https://doi.org/10.1099/ijsem.0.005528>] (not an official ICSP publication) and Notification List [<https://doi.org/10.1099/ijsem.0.005736>]
- Valid publication of four more phylum names [<https://doi.org/10.1099/ijsem.0.006024>] (not an official ICSP publication) and Notification List [<https://doi.org/10.1099/ijsem.0.006158>]

Was the ICSP decision on phylum names made hastily?

No. The first proposal to include phylum names in the ICNP dates back to a paper by Oren et al. published in 2015. This was only a proposal; no ICSP decision was made at the time. This paper listed names that could potentially be validly published once the new rule was introduced into the ICNP, and also listed the differences to the known phylum names that are not validly published. This was followed by another publication (by Whitman et al.) in 2018, which modified the proposal and reiterated the differences between phylum names. Again, no ICSP decision was made at this time. The decision was made by the ICSP in 2021 after an open debate, so there was plenty of time to comment on the proposals.

In contrast, the inclusion of phylum rank in the ICNP may be considered belated. This is indeed a valid criticism, as it is disadvantageous for an important taxonomic category to be in unregulated use for a long time before a standardized naming scheme is introduced for it. The unregulated use of taxon names at a particular rank over a long period of time can result in many names that do not conform to a particular scheme. The ICSP has learned this lesson. The taxonomic use of important taxonomic categories not yet included in the ICNP is now being closely monitored with a view to initiating further additions to the ICNP as soon as possible.

See also:

- 2015 paper [<https://dx.doi.org/10.1099/ijsem.0.000664>] (not an official ICSP publication)
- 2018 paper [<https://dx.doi.org/10.1099/ijsem.0.002593>] (not an official ICSP publication)
- ICSP debate on phyla [https://www.the-icsp.org/images/reports/20210228_Discussion_-_Phylum_Compiled_contributions_-_20201101-20210228-Final.pdf]
- Introduction of phylum category [<https://dx.doi.org/10.1099/ijsem.0.004851>]
- Proposal to introduce the categories domain and kingdom into the ICNP [<https://doi.org/10.1099/ijsem.0.005650>] (not an official ICSP publication)
- Acceptance of introducing the categories domain and kingdom into the ICNP by the ICSP [<https://doi.org/10.1099/ijsem.0.006123>]
- Valid publication of two names of domains and seven names of kingdoms [<https://doi.org/10.1099/ijsem.0.006242>] (not an official ICSP publication)

Was the ICSP decision on phylum names democratic, transparent and open?

Yes. The announcement of the proposals, the debate and the subsequent vote were conducted as described above. There were ample opportunities to comment on the proposals prior to the ICSP's decision, which was taken more than five years after the initial proposal to include phylum names in the ICNP.

See also:

- 2015 paper [<https://dx.doi.org/10.1099/ijsem.0.000664>] (not an official ICSP publication)
- ICSP debate [https://www.the-icsp.org/images/reports/20210228_Discussion_-_Phylum_Compiled_contributions_-_20201101-20210228-Final.pdf]
- Introduction of phylum category [<https://dx.doi.org/10.1099/ijsem.0.004851>]

Was the ICSP vote on phylum names narrow?

No. The proposal to include the phylum category in the ICNP was accepted by 19 delegates and rejected by only two. All the proposals considered implied the formation of some phylum names distinct from well-known, not validly published (colloquial) phylum names such as “*Firmicutes*” or “*Proteobacteria*”. It was more controversial whether class or genus should be used as category of the nomenclatural types of phyla (seven delegates supported class, 10 supported genus, three abstained and one gave a blank vote). However, this did not affect the differences between the now validly published names of phyla and known but not validly published names of phyla. For example, the validly published counterpart of “*Firmicutes*” would have been *Bacillaeota* according to the 2015 proposal by Oren et al., based on the name of a class; *Bacillota* according to the 2018 proposal by Whitman et al., also based on the name of a class; and also *Bacillota* according to the 2021 implementation in the ICNP, based on the name of a genus.

See also:

- 2015 paper [<https://dx.doi.org/10.1099/ijsem.0.000664>] (not an official ICSP publication)
- 2018 paper [<https://dx.doi.org/10.1099/ijsem.0.002593>] (not an official ICSP publication)
- ICSP debate [https://www.the-icsp.org/images/reports/20210228_Discussion_-_Phylum_Compiled_contributions_-_20201101-20210228-Final.pdf]
- Introduction of phylum category [<https://dx.doi.org/10.1099/ijsem.0.004851>]

Why do the validly published phylum names look different to their not validly published counterparts?

The vast majority of taxon names above the rank of genus are derived from the name of a type genus (or the type genus of the type order). All names above the rank of genus, when governed by one of the three major nomenclature codes (botanical code – ICNafp, zoological code – ICZN, microbiological code – ICNP), are formed by adding a category-specific ending to the stem of the name of a type genus. The naming scheme for phyla introduced in the ICNP is consistent with the approach used for other names above the rank of genus, but with a new ending (*-ota*) specific to that category. The nomenclature codes (ICNafp, ICZN, ICNP) do not regulate classification. Therefore, it is logical and useful to derive the name of a taxon above genus rank from the name of the nomenclatural type. The nomenclatural type is the only element guaranteed to be permanently associated with the taxon for which it serves as type. Deriving a name in this way has no effect on the total number of genera taxonomically placed within a taxon above genus rank. Most of the validly published phylum names are very similar in spelling to the corresponding non-validly published phylum name. A clear advantage of the new names is that their category can be easily inferred from the name.

See also:

- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- ICNafp [<https://www.iapt-taxon.org/nomen/main.php>]
- ICZN [<https://code.iczn.org>]
- Overview on regular endings of names above genus rank and their origin [<https://dx.doi.org/10.1099/ijsem.0.005650>] (not an official ICSP publication)
- Judicial Opinion 129 [<https://doi.org/10.1099/ijsem.0.006064>]

Why are there validly published phylum names which more obviously differ from their not validly published counterparts?

Substantial differences between the new, validly published names of phyla and their old, not validly published counterparts are unfortunate but unavoidable under the rules of the ICNP. The phylum names “*Actinobacteria*”, “*Crenarchaeota*”, “*Euryarchaeota*”, “*Firmicutes*”, “*Proteobacteria*”, “*Tenericutes*” and “*Thaumarchaeota*” are not validly published and therefore have no claim to recognition under the ICNP. These names are not derived from the name of a nomenclatural type and therefore do not fit into the scheme now envisaged for the formation of phylum names, which is well justified. (Other phylum names not validly published did not have the *-ota* ending either, but were at least derived from the name of a genus). Since their category cannot be recognized from the name, these not validly published phylum names caused further problems. For example, *Actinobacteria* is also the name of a class and is even validly published as such (albeit illegitimate). Similarly, *Proteobacteria* is a validly published but illegitimate name at the rank of class (the class name was placed on the list of rejected names in 2023). The name “*Crenarchaeota*” has been used at the levels of kingdom, phylum, subphylum and class. The name “*Euryarchaeota*” has been used at the levels of kingdom, phylum and subphylum. The naming scheme for phylum names now implemented in the ICNP avoids such problems.

See also:

- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- Class *Actinobacteria* [<https://doi.org/10.1099/00207713-47-2-479>] (not an official ICSP publication)
- Class *Proteobacteria* [<https://doi.org/10.1099/00207713-38-3-321>] (not an official ICSP publication)
- Kingdoms “*Crenarchaeota*” and “*Euryarchaeota*” [<https://doi.org/10.1073/pnas.87.12.4576>]
- Class *Crenarchaeota* [<https://doi.org/10.1099/00207713-52-1-7>] (not an official ICSP publication)
- Subphylum “*Euryarchaeota*” [<https://doi.org/10.1017/s0006323198005167>] (not an official ICSP publication)
- Rejection of class names such as *Proteobacteria* [<https://doi.org/10.1099/ijsem.0.005797>]
- Rejection of division names such as *Firmicutes* [<https://doi.org/10.1099/ijsem.0.006064>]

Could the more obviously deviating phylum names be formed in a less deviating way?

No. One of the cornerstones of the ICNP is the status of “valid publication”. Names that are not validly published do not have claim to recognition under the ICNP. The phylum names “*Actinobacteria*”, “*Crenarchaeota*”, “*Euryarchaeota*”, “*Firmicutes*”, “*Proteobacteria*”, “*Tenericutes*” and “*Thaumarchaeota*” are not validly published. Therefore, a hypothetical approach to form validly published phylum names by adding *-ota* to the stem of these names could not be justified under the ICNP. In fact, no attempt has been made to implement phylum names in this way since 2022. Moreover, deriving a name above genus rank from the name of the type genus (or the type genus of the type order) has clear advantages, as explained above. In particular, the ICSP does not create names, nor can it change names at will. Rather, the ICSP publishes general rules on how to form names by including them in the ICNP.

See also:

- ICSP Statutes [<https://dx.doi.org/10.1099/ijsem.0.003117>]
- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- Introduction of phylum category [<https://dx.doi.org/10.1099/ijsem.0.004851>]
- ICSP response to criticism of new phylum names [<https://dx.doi.org/10.1038/s41579-022-00706-z>]
- Second ICSP response to criticism of new phylum names [<https://dx.doi.org/10.1128/mbio.01479-22>]
- Judicial Opinion 129 [<https://doi.org/10.1099/ijsem.0.006064>]
- Explanatory article [<https://doi.org/10.1038/s41522-024-00494-9>] (not an official ICSP publication)

Is it difficult to recognize the synonymy between the validly published phylum names and their not validly published counterparts?

We don't think so. Of course, at first sight, the exchange of names in databases or in the literature can be irritating. However, such an exchange could only cause significant problems for users or readers if the synonymy between the names remained unclear. There are two ways of knowing that two names are synonymous: remembering the synonymy or being able to infer it. Remembering the synonymy between one to six pairs of taxon names is a task that most trained scientists can do anyway, especially if they work frequently with the taxonomic group in question. However, synonymy between phylum names could also be inferred with ease, although some other knowledge would be required. We argue that this does not place an additional burden on users of phylum names, as they would benefit from this knowledge anyway. Users would need to be aware of the following aspects:

1. The standardized ending *-ota* is used for phylum names. As there is a standardized ending for phylum names, any microbiologist working with phylum names should benefit from being able to recognize a phylum name from having that ending. However, once it is clear that the ending *-ota* indicates a phylum it is also possible to recognize the first part of such a phylum name, which is obtained by removing *-ota*.

2. It is helpful for anyone dealing with taxonomic nomenclature to understand that a nomenclatural type is permanently associated with the taxon for which it serves as the nomenclatural type. It is also useful to understand that names of taxa above genus rank are almost exclusively formed by appending a category-specific suffix to the stem of the name of a nomenclatural type.
3. If a microbiologist has used, or is using, a phylum name, that microbiologist would benefit from knowing at least some taxa of lower rank that are classified in that phylum. For example, we assume that any microbiologist trained in the last two decades will know that *Actinomyces* was classified in “*Actinobacteria*”, that *Bacillus* was classified in “*Firmicutes*”, and so on. It is now easier to make sense of phyla in this way.

Someone with this knowledge can easily infer the synonymy between each pair of phylum names. For example, if the name *Bacillota* is recognized as having the phylum suffix *-ota*, it can be inferred that the stem of the name is *Bacill-*, which is also used in the names *Bacilli*, *Bacillales*, *Bacillaceae* and *Bacillus*. It is only necessary to know that one of these taxa was classified in the phylum “*Firmicutes*” in order to link *Bacillota* with “*Firmicutes*”. We conclude that everything that would be needed to recognize the synonymy between each pair of phylum names would be better known anyway by anyone who needs to recognize that synonymy. Thus, the exchange of phylum names in databases or in the literature may be a bit confusing at first glance, but we don't think it's a significant problem. We believe that the long-term benefits of the new standardised phylum names outweigh any short-term irritation they may cause.

See also:

- ICSP Statutes [<https://dx.doi.org/10.1099/ijsem.0.003117>]
- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- Introduction of phylum category [<https://dx.doi.org/10.1099/ijsem.0.004851>]
- Explanatory article [<https://doi.org/10.1038/s41522-024-00494-9>] (not an official ICSP publication)
- ICSP response to criticism of new phylum names [<https://dx.doi.org/10.1038/s41579-022-00706-z>]
- Second ICSP response to criticism of new phylum names [<https://dx.doi.org/10.1128/mbio.01479-22>]
- Judicial Opinion 129 [<https://doi.org/10.1099/ijsem.0.006064>]

Did names of archaeal phyla ever have the suffix *-archaeota*, or should they have that suffix?

No. Names like “*Crenarchaeota*” may indeed give the impression that they have an *-archaeota* suffix. But this is not the case. The name is composed as follows: *Cren-* (stem of *krênê* when Latinized, Greek *κρήνη*, genitive *κρήνης*) + *archae-* (stem of *archaeum*, originally from Greek *ἀρχαῖος*) + *-ota* (adjectival suffix). So *-archaeota* is not a suffix; *-ota* is. Furthermore, suppose you wanted to implement the suffix *-archaeota* for archaeal phyla and then derive a phylum name from, say, a type genus called *Halarchaeum*. This would yield *Halarchaearchaeota* (*sic*), hardly a pleasant result. One must consider that the *archae-* component of names such as “*Crenarchaeota*”

is not part of a suffix, i.e. *-archaeota* is not actually a suffix but the penultimate component of the taxon name plus the actual suffix. If a genus name ending in *-archaeum* was chosen as type genus, then this would already result in phylum name ending in *-archaeota*. It is not necessary to change the standardized ending for archaeal phylum names to achieve this effect.

In general, it is unwise to encode taxonomic affiliation with a higher-ranked taxon in a name above species rank. The regular derivation of names above genus rank in the ICNP works in the opposite direction: they are derived from the name of a genus. Since that genus is the nomenclatural type (or the nomenclatural type of the nomenclatural type), it is guaranteed to be permanently associated with the taxon for which it serves directly or indirectly as type, whether treated as the correct name or as a synonym. In contrast, the assignment of a taxon to a higher taxon, such as the assignment of the class *Deltaproteobacteria* to “*Proteobacteria*” (*Pseudomonadota*), is a matter of taxonomic opinion. Since many taxonomists today place *Deltaproteobacteria* in a different phylum from that to which *Alpha-*, *Beta-* or *Gammaproteobacteria* are assigned, the situation may be confusing (although changing the names would be even more unfortunate). Such problems only occur because the name of the superordinate taxon has been encoded in the name of the subordinate taxon. This way of forming names is no longer allowed under the ICNP.

See also:

- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- Judicial Opinion 116 [<https://dx.doi.org/10.1099/ijsem.0.005481>]
- Kingdoms “*Crenarchaeota*” and “*Euryarchaeota*” [<https://doi.org/10.1073/pnas.87.12.4576>] (not an official ICSP publication)
- Overview on regular endings of names above genus rank and their origin [<https://dx.doi.org/10.1099/ijsem.0.005650>] (not an official ICSP publication)
- Judicial Opinion 129 [<https://doi.org/10.1099/ijsem.0.006064>]

Does the name *Actinomycetota* indicate fungi?

Not really. The validly published name *Actinomycetota* denotes the phylum that was previously known as “*Actinobacteria*” – a problematic name because it is not derived from the name of its nomenclatural type and because it is eponymous with the validly published (albeit illegitimate) name of a class. The name *Actinomycetota* is derived from *Actinomyces*, and the *-myces* component of this genus name does indicate a fungus. However, we suspect that most microbiologists are well aware that genera such as *Actinomyces* and *Streptomyces* are bacteria. While the use of the *-myces* component in prokaryotic names is no longer permitted by the ICNP (2022 Revision), there are historical reasons for the occurrence of these names. The phylum name *Actinomycetota* is also a much better fit than “*Actinobacteria*” with the validly published and legitimate names used at the ranks of class, order, family and genus: *Actinomycetes*, *Actinomycetales*, *Actinomycetaceae*, *Actinomyces*. Replacing them by names not indicating fungi has no basis in the ICNP and would cause far more problems than the current names themselves. In the botanical code (ICNafp) names of fungal phyla have the suffix *-mycota*. Deriving a phylum name from *Actinomyces* under this code would result in *Actinomycetomycota* or *Actinomycota*. Confusion is therefore unlikely.

See also:

- ICNP [<https://dx.doi.org/10.1099/ijsem.0.000778>]
- Introduction of phylum category [<https://dx.doi.org/10.1099/ijsem.0.004851>]
- Explanatory article [<https://doi.org/10.1038/s41522-024-00494-9>] (not an official ICSP publication)
- Judicial Opinion 119 [<https://dx.doi.org/10.1099/ijsem.0.005481>]
- ICNafp [<https://www.iapt-taxon.org/nomen/main.php>]