



## Description

Research can be hard enough without worrying about how to use microbial nomenclature or scientific names of bacteria accurately. Writing bacteria names in a research article can be a big challenge for scientists, as the guidelines change to reflect new discoveries. Moreover, Latin names may be confusing. In the [first article](#) of this series, we discussed effective tips on writing scientific names of plants and animals. This article will give you an overview of the biggest issues researchers encounter in using microbial nomenclature and some tips to keep you on track.

## How are Bacteria Named?

The International Committee on Systematics of Prokaryotes (ICSP) has created guidelines that explain the proper nomenclature or naming system for bacteria. This system is known as the Bacteriological Code. A bacterium has a binomial name that consists of two parts: the genus name, which indicates which genus it belongs to and the species epithet.

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When referring to a bacterium in a paper, the writer should underline or italicize the names in the text. After writing the complete name of a microorganism in the first mention, the genus name can be shortened to just the capital letter.

- For example, *Moraxella bovis* can be written *M. bovis*.

The ICSP recommends spelling out the entire name of any bacteria again in the summary of your publication.

When discussing unnamed species, the abbreviation “sp.” is used to refer to a single unnamed species. Whereas “spp.” written after a genus refers to more than one unnamed species.

- For example, *Moraxella* sp. would be used to discuss one unnamed species of *Moraxella*.

Bacteria are often divided into subspecies, which are indicated by subdivisions such as biovar, chemoform, chemovar, cultivar, morphovar, pathovar, serovar, and state.

These subdivisions should be written in plain text preceding an additional italicized or underlined name. For example, “*Rhizobium leguminosarum* biovar *viciae*” would be correctly written as *Rhizobium leguminosarum* biovar *viciae*.

## Common Issues in the Use of Microbial Nomenclature

However, there are some common issues that researchers encounter when using microbial nomenclature. The first, as you might have guessed, is that different types of bacteria might appear to be the same when their names are abbreviated.

*M. bovis* could indicate *Moraxella bovis*, *Mycoplasma bovis*, or *Mycobacterium bovis*.

In this case, the author should simply take care to either avoid using abbreviations if they might be confused, or be sure to clearly state which bacterium is being discussed.

Other issues that researchers encounter with microbial nomenclature are more complex. While the Bacteriological Code is often interpreted as the “official” list of valid names for bacteria, the Code only provides guidelines on *how* bacteria should be named. This allows for disagreement, discovery, and evolution in scientific research. For example, one group of researchers might classify a bacterium to genus A. Similarly, another group of researchers might conduct different research and conclude that the same bacterium belongs to genus B. Continuing with our previous example of the *bovis* species, one bacterium might be referred to as *A bovis* in one article and *B bovis* in another.

## How Do I know If the Microbial Nomenclature I’m Using is Valid?

Many researchers mistakenly believe that the most recently published name is the “correct” name. In fact, as we saw above, this is not the case. A name must be published in an article in the *International Journal of Systematic and Evolutionary Microbiology*. It may also be published elsewhere if announced in the Validation Lists. Microbial nomenclature is, in other words, a matter of scientific judgment and consensus.

For example, *Helicobacter pylori* was immediately accepted as a replacement for *Campylobacter pylori* by the scientific community, whereas *Tatlockia micdadei* has not generally been accepted as a replacement for *Legionella micdadei*.

Finally, the ICSP does not give specific guidelines for how to indicate taxa after subspecies, such as strain designation. Strain designation should follow the genus and species and is generally a combination of numbers and letters.

For example, you might write *Helicobacter pylori* K164:K7, with K164:K7 indicating the

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specific strain of bacteria used in your work.

When you are in doubt about the correct usage microbial nomenclature in your writing, your first stop should be The International Code of Nomenclature of Bacteria (1990 Revision). Stay up to date on relevant publications in your field and be aware of any disagreements or new discoveries regarding the classification of bacteria. Finally, remember that valid names are a matter of scientific judgment and consensus.

Was this article helpful? What other problems or issues have you encountered in using microbial nomenclature in your writing? Let us know in the comments!

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