

LABIP Expert Workshop: Major changes in the taxonomy of *Bifidobacterium* and *Lactobacillus*; consequences for industry, 4-5 October 2018, Verona, Italy

Introducing the Subcommittee on the taxonomy of “*Bifidobacterium*, *Lactobacillus* and related genera” and the procedure for publishing taxonomic names

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Taxonomy and systematics involve classifying organisms according to natural and evolutionary relationships. The current system used by all scientists dates back to Swedish botanist Carl Linnaeus who in 1735 established a way of naming, ranking, and classifying organisms. In the scientific classification established by Linnaeus, each species has to be assigned to a genus (binary nomenclature), which in turn is a lower level of a hierarchy of ranks (family, suborder, order, subclass, class, division/phyla, kingdom and domain). To avoid the confusion that would be caused by several taxonomists giving different names to the same organism at the same time, the taxonomic communities have long-established codes of practice for nomenclature of bacteria. Thus the International Committee on Systematics of Prokaryotes (ICSP) and the International Code of Nomenclature of Bacteria (Bacteriological Code) are responsible for the naming of prokaryotes. The ICSP is the body that oversees the nomenclature of prokaryotes, determines the rules by which prokaryotes are named and whose Judicial Commission issues Opinions concerning taxonomic matters, revisions to the Bacteriological Code, etc. The precepts on which this system of bacteriological nomenclature is based are divided into principles, rules, and recommendations. The principles (Chapter 2) form the basis of the rules and recommendations. The rules (Chapter 3) are designed (a) to make effective the principles given in Chapter 2, (b) to put the nomenclature of the past into order, and (3) to provide for that of the future. Thus naming of organisms is tightly governed by the Code. The ICSP relies on various subcommittees for taxonomic matters which are constituted by experts on the relevant bacterial groups, such as the Subcommittee on the Taxonomy of *Bifidobacterium*, *Lactobacillus* and related organisms. These subcommittees can suggest minimal standards for identification of new taxa of the organisms in question and the last recommended minimal

standards description of new taxa of the genera *Bifidobacterium*, *Lactobacillus* and related genera were published by Mattarelli et al. in 2014. However, taxonomy, like bacterial diversity is evolving. New methods such as multilocus-sequence analyses or genomics-driven taxonomy are now state of the art and a thorough revision of the previously published minimal recommended standards is required. Nevertheless, minimal standards for description of new taxa are to be seen separately from naming of the taxa which proceeds according to the rules of the Bacteriological Code.