

Availability of Cited Microbial Strains

We wish to bring to your attention the longstanding problem of continued availability of microbial strains cited in scientific publications. Journals ask that authors citing microorganisms in their papers include strain accession numbers in the materials and methods sections. Access to these strains is viewed as necessary for verification and extension of the reported work just as GenBank or EMBL (European Molecular Biology Laboratory) accession numbers are required for nucleotide sequences. The strain accession numbers often provided are individual laboratory numbers, not those of publicly accessible culture collections. Most authors make their strains available after publication; but not infrequently, cultures are lost because of personnel changes, equipment failures, and changes in research direction. Much less often, authors release strains only to those who will collaborate with them in future use of the strains; this limits individual research freedom.

Consequently, our concern is that published strains become available to the scientific community in a timely manner and without a tangle of restrictions. We recognize the recent trend among investigators to require that a materials transfer agreement (MTA) be signed before strains with commercial potential can be distributed. Whether this is compatible with the intent of full disclosure in a scientific publication is subject to debate, but distribution under an MTA does make cited microbial germ plasm available for future research, and culture collections are familiar with MTAs.

Are culture collections able to handle the increased workload when culture deposits

become a requisite for publication? We have had discussions with the directors of several international culture collections, and the answer is that every effort will be made to access these new strains because they are viewed as an investment by society that should be maintained for future generations of scientists. Where to deposit? There are a large number of internationally accessible culture collections, and they are listed with mailing addresses by the World Data Centre for Microorganisms at <http://wdcm.nig.ac.jp>.

Some papers include numerous strains from surveys. Here deposits can be problematic because a culture collection could be overwhelmed by sheer numbers of new deposits. A solution is for author(s) and editor to make an educated appraisal of the situation and then deposit representative or "key" strains that convey the essence of the work. Admittedly, this can be a difficult exercise in judgment because microorganisms are not often easy to identify. For that reason alone, giving the name of an organism without providing a culture is counter to the objective of being able to repeat an experiment.

The importance of reproducibility of scientific results cannot be minimized. We ask that journals continue to require authors to cite strain numbers in their publications and, further, that the cited accession numbers be those of a publicly accessible culture collection. Journal review forms usually have a checkoff box asking whether nucleotide sequences need to be deposited before publication. A similar checkoff box needs to be present for microbial culture-collection numbers. In this way, the invest-

ment of research funds is preserved, and the often unique germ plasm of the experimental organisms is maintained for future generations of researchers. The example of development of the polymerase chain reaction (PCR) through use of a deposited culture of *Thermus aquaticus* illustrates this point well.

We appreciate your consideration of this matter and welcome comments about it from you and your colleagues.

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