

**The 12<sup>th</sup> Committee for Microbe Resource  
Evaluation and Suggestions**

(April 13, 2016)

**Microbe Division (Japan Collection of Microorganisms–JCM)**

**Division Head: Moriya Ohkuma**

◎: Compulsory report items ○: Major report items ●: Optional report items

◎ 1–1a. *Have sufficient results been achieved? (The BRC's standing in the world, contribution to society)*

- From the following perspectives, it can be evaluated as meeting expectations:
  1. Performance above the target values in both collection and distribution, and yielding world top-class results in the number of research papers published by users, quality management, and preparation of genome information.
  2. An increase in the number of depositions, appropriate response to the increase in depositions, and JCM's ranking as second best in the world demonstrate the deep level of trust it has earned from the microbial research community both in Japan and overseas.
  3. An increase in the number of research papers by users indicates project results themselves have been passed on to society.
  4. JCM made obvious contributions to microbial research in Asia, and that clearly states its strategies as a research infrastructure. It is hoped that contributions will be extended to the nations of Africa and South America.
- The Committee points out and makes suggestions to produce sufficiently enhanced performance in the future:
  1. A system for gene sequence check of all available strains should be continuously maintained. It is hoped that new quality check methods will be developed and further extensive efforts will be made with respect to quality management.

2. Genomes for yeasts and fungi have been sequenced. It is hoped that methods of publishing genome information will be derived for increasing use and that explanations will be provided next year saying that favorable results have been obtained.
3. Judging from the current systems, inconclusive results may occur unless priorities are made clear at every given moment. With limited human resources, it is necessary to decide whether to get rid of something, and if not, to aim for greater efficiency.
4. To the greatest extent possible, new resource developments should not be directed just at new taxonomic knowledge, but also at microbes related to the environment and health.

© *1-1b. Responses to previous comments and advice*

- It can be evaluated as adequately addressed, but for some portions that are deemed insufficient, the Committee points out and makes suggestions as follows:
  1. The BRC has carried on enthusiastically in the face of various constraints. It is commendable that previous remarks have been dealt with seriously and appropriately, including pre-distribution testing of strains that have not undergone gene sequence check and speedy distribution in response to needs.
  2. Concerning the introduction of MALDI-TOFMS and the genome sequencing, continuous efforts should be made to obtain a budget for these. MALDI-TOFMS has even been introduced into laboratories in developing countries and is producing positive results. This fact can be added to the budget request as a reference. The possibility of constructing a system in which this kind of mass spectrometry is used in conjunction with another institution should be considered.
  3. The collection strategy is insufficiently proactive. The supplementary budget for FY2015 includes nothing but requests for purchasing replacements for old equipment, and the Committee hopes that a proactive strategy is implemented in the future.

○ *1-2. Is the self-analysis of strengths and weakness adequate?*

- It can be evaluated as adequately analyzed. The Committee offers the following suggestions for further improvement:
  1. The analysis of strengths is sufficient. The items that are mentioned as weaknesses are difficult to deal with, but since the analysis shows that JCM has many employees who are close to retirement, the Committee requests that the BRC make plans for technological continuity so that transitions go smoothly.
  2. It is necessary to analyze any weaknesses, because the focus is changing from taxonomy, the previous field of expertise, to microbes in the areas of the environment and health, and because this is happening during a period of constraints.

© 1–3. *Is the plan reasonable for the medium to long term?*

- From the following perspectives, it can be evaluated as generally reasonable, but the Committee offers the following suggestions for further improvement:
  1. Specific fields to emphasize have been determined and specific policies when executing the plans have been fully considered, and it is expected that the plans will be adequately realized.
  2. It is hoped that specific methods will be presented for the stated orientation of “Resources for Accelerated Research Aimed Solving Issues Related to Society’s Urgent Needs” and that systems to achieve it will be created.
  3. It is hoped that there will be specific strategies to develop technologies for fastidious microbial resources.
  4. The Nagoya Protocol should be dealt with appropriately by solidly grasping the status of the domestic measures related to it, exchanging opinions with WFCC and other overseas institutions, and learning about trends there. Rights of ownership for genome information of resources could become controversial in developing countries, and it is assumed that this will affect academic use.

© 2a. *Have appropriate fields been earmarked for future prioritization?*

- It can be evaluated as generally adequate, but for some portions that are deemed insufficient, the Committee points out and makes suggestions as follows:

1. Current research on microbes has reached a turning point. This is a shift from pure cultures to symbiotic systems, as expressed in the spread of the word “biome.” Mentioning symbiotic microbes as an area of emphasis is extremely appropriate. Given systems for implementation of these plans and the specificity of the research themes, it is anticipated that positive results will be obtained.
2. Regarding the coming “Plant Symbiosis Research Team (tentative name),” the plan to have every step coordinated with JCM operations should be reconsidered, and the plan should include questions such as “How are the proposals based on society’s needs?” “Why will it be concerned only with symbiosis with plants?” “What resources will be developed and, specifically, in anticipation of what kinds of users?” “What results can be expected?” The proposal should be attractive enough that anyone would agree to it.
3. There will be a high level of demand for additional information and research results concerning complex microbial systems and consortium microbes. It is not a bad idea to offer genome information about complex and symbiotic microbes as new resources, and it is possible to develop this with a strong point of JCM, but the process to present them as a new JCM resource is unclear.

© 3-2. *Are the policies for future resource infrastructure and technology development appropriate?*

- From the following perspectives, it can be evaluated as generally adequate, but for some portions that are deemed to have room for improvement, the Committee points out and makes suggestions as follows:
  1. Based on highly persuasive previous results, human indigenous microbes are an appropriate resource to prepare. Preparation of genome and omics information is also something that is growing along with developments in microbiology, and it is judged that there is great potential for making a contribution in this regard. Creating resources from fastidious microbes is a cutting-edge issue, and there are actual research results in this area, so JCM should be able to become a world leader. It is anticipated that synergistic results will be gained in the various subjects that are linked to this field.

2. The orientation is appropriate, and several results have been achieved, but it would be a good idea to indicate a bit more clearly which aspects will be emphasized.
3. It would be ideal to present specific plans for resource infrastructure and technology development plans with respect to the preparation of microbes that can accelerate problem-solving type research in the environmental fields.

### *3-3. Innovation hub*

- It can be evaluated as generally sufficient, but for portions that are deemed insufficient, the Committee points out and makes suggestions as follows:
  1. Concerning the fact that many type strains are distributed, it is hoped that this will be mentioned more clearly in the “Search for users” and responses or plans based on that will be worked out.
  2. Increased exposure for databases should be a goal, so that the JCM number can be reached using keywords, and it is recommended that when being requested to distribute the strain, clients should be asked their reasons for choosing that particular strain.
  3. It is anticipated that collection of resources will continue to increase given appropriate efforts. On the other hand, once a resource has been distributed, it can be stored continuously, so the same resource is not used repeatedly. In order to increase the number of new users and expand projects, it is necessary to strive to cultivate new users through open invitations to unexplored foreign countries.

#### ● *(i) Collaborations with industry, government, and academia*

- It can be evaluated as generally sufficient, but for portions that are deemed insufficient, the Committee points out and makes suggestions as follows:
  1. It would be ideal to indicate strategies for the involvement of resource infrastructure in ties with the industrial sector.
  2. It would be desirable to go one step farther in plans for collaboration with the industrial sector so that the collaboration involves not only the use of resources but also the ability to acquire any leftover resources. It is necessary to consult carefully with partners and propose plans that take the future into consideration.

● *3–5. Training of global human resources*

- It can be evaluated as generally sufficient, but for portions that are deemed insufficient, the Committee points out and makes suggestions as follows:
  1. Training of curators from major Asian countries at JCM is a valuable activity. It makes a major contribution to building up networks. Even though staff members are pressed for time, they are judged to have dealt with this well. In particular, training in the management of the BRC and training in taxonomy for quality control are important steps in the establishment of the BRC in developing countries.
  2. Opportunities within the framework of international collaboration among Asian countries can be proactively used. At the moment, a heavy burden is being placed on employees, but taking in trainees is effective in fostering global human resources. The ripple effect of this training is huge, and viewed in the long term, it will be even more valuable in the future.

● *4. Collaborations among the RIKEN Centers*

- It can be evaluated as generally sufficient, but for portions that are deemed insufficient, the Committee points out and makes suggestions as follows:
  1. These collaborations seem to be based on actual performance, but it is better to establish issues with greater freedom by involving outside RIKEN, instead of collaborating with familiar parties.