RIKEN BioResource Center Resource Committee of Cell Engineering Division Review Sheet
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Cell Engineering Division

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Summary

1. Achievements during the last three years (FY 2006 to FY 2008)—banking, research and development, international collaboration, public relations, training and education, and others

- **Evaluation**

  The RIKEN BRC brand image was upheld, and excellent results were achieved.

  Specific Comments:

  - The systematic collection and distribution of ES and iPS cell lines is highly appreciated by the research community, and the expedient measures being taken in these areas are evaluated highly.

    Collection of cancer cell lines, animal cell lines, cells for genetic analysis, and other materials is also progressing on schedule.
  - A high level has been maintained in the areas of supportive services, stable consistency, and reliability regarding cell quality.
  - In relation to technology development, methods for authentication of cells have been established, i.e., the method to detect mycoplasma infection, short tandem repeat (STR) polymorphism analysis to exclude cross contamination between human cell lines, and simple sequence length polymorphism (SSLP) analysis to exclude cross contamination between mouse cell lines. In addition, standard operating procedures (SOP) have also been established. Quality management system (QMS) based on the SOP has been accredited by ISO9001/2000.
  - Achievements are also noteworthy in the areas of international exchange, public relations, and human resource development.
  - Targets must be set for areas which require improvement.

- **Advice and suggestions**

  - Effort should be made to assume the role of an educational center regarding technologies of cell culture. For example, internship program may be useful.

- Research and development (R&D) should be pursued in the following areas, i.e., evaluation of virus contamination other than biohazard virus, serum-free culture method, and automatic culturing equipment. The R&D work of the satellite facilities should be evaluated properly.
- In relation to human resources who work in cell culture field, RIKEN BRC must play the role of a national center by exchanging information and collaborating with related institutions to develop a training course and strategic curricula. In addition, activities targeting the public and private sectors, such as a technician training and dispatching service, should be promoted assertively.
- Development of cell-derivative, e.g., cells expressing some marker, may be useful.
- Creation of an Asian hub should be explored in addition to the current international collaborations. Intellectual property issues will need to be considered, but there should still be room for technological exchanges or even resource development.

2. Responses to issues raised in the Resource Committee meetings of the past three years (FY 2005 to FY 2007)

- **Evaluation**

  Response was prompt and direct, results have been satisfactory, and BRC's activities have been furthered as a result.

  Specific Comments:

  - The newest lines of ES and iPS cells and similar materials have been collected and distributed; approval was obtained quickly from a ministry (MEXT) on human ES cell distribution. These items are to be commended.
  - The efforts made to simplify the procedure for use of human umbilical cord blood are to be commended.
  - Great strides were made in the active promotion of quality control measures and the standardization of cell lines.
  - Prioritization procedures in the collection of cellular material are operating smoothly.
  - By upholding the RIKEN brand, collaborative relationships were successfully established in advanced technology disciplines.
  - Efforts were made using direct approaches and have generally been effective, but action is still required to address specific issues in detail.

- **Advice and suggestions**
  - Financial planning policies and measures are important. Acquiring funds from the private sector should be considered, such as setting up a program akin to an endowment to fund

collaborative research. Also, emphasis on connecting regenerative medicine with the bioresources activities may bring in funding.

- The services provided should be subsidized as a matter of national policy.
- Researchers should be regularly surveyed regarding their cell line needs.
- Becoming a core center for Asia is desirable.
- Tools (primers, positive controls, etc.) to analyze mycoplasma infection and cell cross-contamination (STR polymorphism analysis) should be made available to users.
- International collaboration on standardization of cell lines is to be commended. Good results are expected.
- There should be a timetable so that it is always clear what the current status is.
- Specific items of advice should not be followed in a mechanical manner, but should be prioritized, taking BRC's fundamental policies into consideration.

3. Are there any bioresources that are needed urgently within the next two to three years

- **Advice and suggestions**
  - Banking of stem cells including human iPS cell lines should be given the highest priority; the overall plan which was drafted is to be commended.
  - As substitutes for cells derived from normal human tissue, differentiated cells derived from ES and iPS cell lines should be systematically collected.
  - Standardization of iPS and ES cell lines requires close collaboration between the developer and advanced research institutes; BRC should work for quick consensus on supplies and follow-up.
  - New methods for assessment (e.g., pluripotency, mono-culture and co-culture differential inducement, etc.) must be established and regularly evaluated.
  - The issues related to iPS and similar cell lines mentioned above are important, and require assertive action.
  - There is a great need for cell resources and animal resources incorporating specialized fluorescent markers for cell sorting and cell imaging.

4. Others

- **Advice and suggestions**
  - Startup of the collection and distribution of ES, iPS, and similar cell lines is a commendable accomplishment. Henceforth, domestic collaborations with academia should be strengthened.
  - Accreditation by ISO9001/2000 regarding QMS and development of technologies regarding mycoplasma infection, virus infection, and culture cross contamination (STR and

SSLP) are highly evaluated internationally.

- The number of international collaborations has increased steadily, which is to be commended.
- Expertise is being accumulated as a bioresource center on a national level. The high morale of Cell Engineering Division Head Nakamura, RIKEN BRC Director Obata and other BRC staff is noteworthy. How to secure the human resources required will be an important issue.
- Overall, the work being carried out is to be highly evaluated as the most systematic operation of any research institutions in Japan. The most important aspect of this type of operation is its continuity; steady, long-term management is needed, along with strict evaluations.
- A flexible policy of financial support from MEXT and other sources, such as funding to cover the NBRP fees, would be desirable to stabilize finances.
- RIKEN BRC's excellence in cell handling and quality control should be further improved to make it into a model technology center. One possibility would be to extend the current training being offered into an internship or fellowship program under the auspices of MEXT.
- Cell line standardization and quality control data related to genetic polymorphism analysis could be treated as standard items to add value to the resources provided.