

The MAQC Project: Calibrated RNA Samples, Reference Datasets, and QC Metrics/Thresholds for Microarray Quality Control

Meeting Date: May 19, 2005 (9 am PDT / 11 am CDT / 12 pm EDT)
 Meeting Place: Teleconference
 Summary Date: May 22, 2005
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- Review of May 2-3 meeting:** Leming Shi briefed the MAQC group of the conclusions of the MAQC face-to-face meeting on May 2-3, 2005 (detailed meeting summary was set out on May 10, 2005). Briefly, each platform will be tested at three test sites (including the microarray manufacturer) with four RNA samples (*i.e.*, Ambion brain RNA, Stratagene UHRR, and two mixtures of the brain RNA and UHRR in a mixing ratio to be determined by the MAQC Pilot Titration Study) and in five replicates per site, resulting in 20 arrays per test site per platform.
- Availability of Brain RNA:** Bob Setterquist updated Ambion's progress towards manufacturing reasonably reproducible and larger batch of the brain RNA sample. It is expected that the brain RNA will be available within two months. Mike Wilson (Ambion) clarified that each batch would in a quantity of above 1 gram of brain RNA.
- Pilot Titration Study:** Rich Shippy introduced the experimental design of the MAQC Pilot Titration Study (Table 1), which is to be conducted by the microarray manufacturers. Bob Setterquist and Mike Wilson will master mix the total RNA samples, split appropriately (approximately 10 ug per sample), and send to microarray manufacturers. The Ambion human brain RNA will be the same as in the MAQC pilot study. The Pilot Titration Study is expected to be completed within one month. The participating manufacturers will form a small group to develop strategies for analyzing the titration datasets. Everyone is encouraged to make suggestions on the analysis of the titration data.

Table 1: Experimental Design of the MAQC Pilot Titration Study

No.	Ambion Brain RNA (%)	Stratagene UHRR (%)	Number of Replicates
1	100	0	6
2	99.5	0.5	3
3	99	1	3
4	95	5	3
5	90	10	3
6	75	25	3
7	50	50	3
8	25	75	3
9	10	90	3
10	5	95	3
11	1	99	3
12	0.5	99.5	3
13	0	100	6
Total number of arrays per site (manufacturer)			45

4. **Cross-platform analysis for selecting genes for validation:** The FDA/NCTR is conducting cross-platform comparison in order to provide information for selecting ~1,000 genes for validation by orthogonal technologies (*e.g.*, TaqMan[®] and QuantiGene[™]) based on the mapping of RefSeq across the platforms. Microarray manufacturers will work together to reach a consensus gene mapping and will also provide sequence information to the MAQC group to conduct sequence-based gene mapping. Volunteers are needed to analyze the pilot study datasets for assessing cross-platform comparability and for selecting genes for validation. If interested, please contact Leming.Shi@fda.hhs.gov.
5. **Publications:** It was suggested that the MAQC group should aim at publishing the major findings in a widely-read journals such as the *Nature* series (*e.g.*, *Nature Methods*) in order to maximize the impact of the MAQC study on the microarray community.
6. **Timeline:** Based on the projected timeline for the availability of the larger batch of Ambion's brain RNA sample (July 2005), it is possible that the microarray data generation phase of the MAQC main study can still be completed by **the end of August 2005**, and the next face-to-face meeting on data analysis can be held in October (or November) in California (Bay area or San Diego).
7. **Other issues:** The issue of including "day effect" in the MAQC main study was brought up by Leming Shi after concerns were raised by eliminating this factor in the main study. However, the majority of the MAQC group appeared to be happy with the decision on conducting five replicates within the same day. It was suggested that each test site should record the day on which a labeling reaction or a hybridization is conducted.
8. **New participant:** Andy McShea (VP, amcshea@combimatrix.com) confirmed Combimatrix's participation in the MAQC main study by agreeing to run its platform(s) at three test sites (including Combimatrix) and to follow the design of the MAQC main study. Combimatrix may also participate in the MAQC Pilot Titration Study.

Next MAQC Teleconference:

Thursday, June 2, 2005 (9 am PDT / 11 am CDT / 12 pm EDT)