

White Paper– RNA Quality Assurance Using RIN

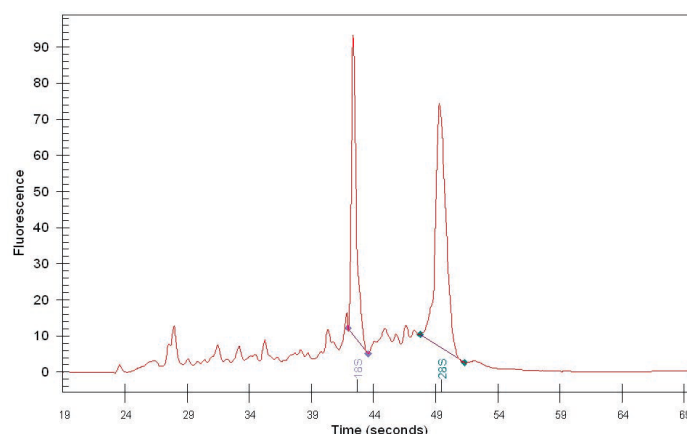
Asterand Bioscience evaluates the quality of our frozen sample RNA using the RNA integrity number (RIN*) utilizing [Agilent Technologies' 2100 Expert Software](#). The RIN allows for an objective and standardized assessment of RNA in frozen human tissues. It is automatically generated and the value takes into account several features commonly ascribed to overall RNA quality^{1,2}.



As described by Agilent, these are:

- Ratio of the area under the rRNA bands to the total area of RNA in the electropherogram
- Ratio of the area in the fast region of the trace to the total area
- Height of the 18S RNA peak
- Height of the lower marker peak

The absolute ratio of the 28S to 18S RNA bands have been shown to be an unreliable marker for quality and usability of total RNA isolated³. In addition, it has been shown that degraded RNA does not rule out the performance of comparative gene expression analysis, as long as the samples being compared are of equal quality^{4,5}. The use of RIN across a ten point scale helps to identify those samples which may be appropriate for comparative analysis.



Advantages of RIN

- Standardized, objective data collection
- Greater range of values for increased applicability of RNA
- Comparison of RNA samples of consistent grade
- Reliable comparison of experiments within and between labs
- For more information please visit the [Agilent Technologies™ RIN webpage](#)

Suggested applications for RNA within different RIN ranges

RIN Value	Most suitable for
1 - 4	PCR assays with short regions of amplification
4.1 - 6.9	qRT-PCR applications
7.0 - 10.0	Highly demanding gene array assays

References:

1. Lightfoot (Agilent), 2002. <http://www.chem-agilent.com/pdf/5988-7650EN.pdf>
2. Mueller et al., 2000. <http://www.ncbi.nlm.nih.gov/pubmed/10634479>
3. Braly et al. (Agilent), 2003. <https://www.agilent.com/cs/library/applications/5988-9861EN.pdf>
4. Auer et al., 2003. <http://www.nature.com/ng/journal/v35/n4/pdf/ng1203-292.html>
5. Imbeaud et al., 2005. <http://www.ncbi.nlm.nih.gov/pubmed/15800207>

*RIN is a general measure, influenced mainly by the rRNA in the sample. There are other characteristics of RNA that may be important for a particular assay and are not correlated with RIN. For instance, samples with RIN below 7.0 are probably useful for gene array assays, particularly if they are compared to samples with similar RIN numbers.

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Issue Code: AB-WP-RIN-0217