RIN, RIN^e and RIS – standardized determination of RNA quality

RNA integrity scores provide information on the quality of RNA before it is used in downstream applications. The quality is indicated by a score ranging from 1 (degraded RNA) to 10 (intact RNA).

This technical note compares the RNA integrity score (RIS) system used by QIAxcel® technology with the RNA integrity number (RIN) used by the Bioanalyzer® 2100 and the RIN equivalent (RIN^e) of the TapeStation®.

An at-a-glance comparison of RNA integrity scoring tools

When RIS was compared with RIN and RIN^e, the data showed correlation of RIS with RIN and RIN^e values (R^2 = 0.92 and R^2 = 0.99, respectively) (Figures 1 and 2).

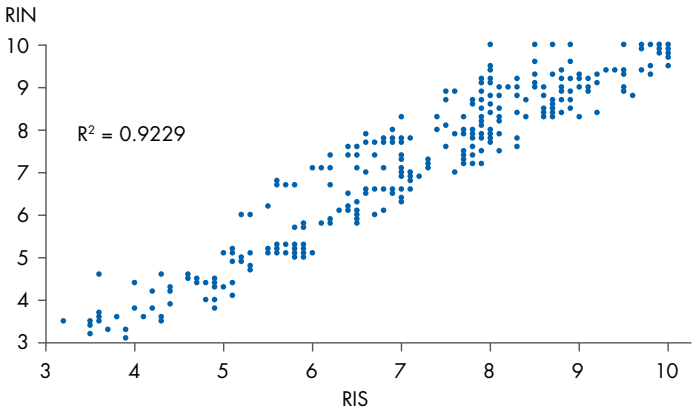

Figure 1. Correlation of RIN and RIS.
RNA samples were purified from rat kidney, rat liver, and Jurkat cells. They were then subjected to a gradient of heat-mediated degradation, and then analyzed in replicates (n=427) on the Agilent® Bioanalyzer 2100 and the QIAxcel system. The RIN and RIS values of the RNA samples were plotted to establish correlation (2).

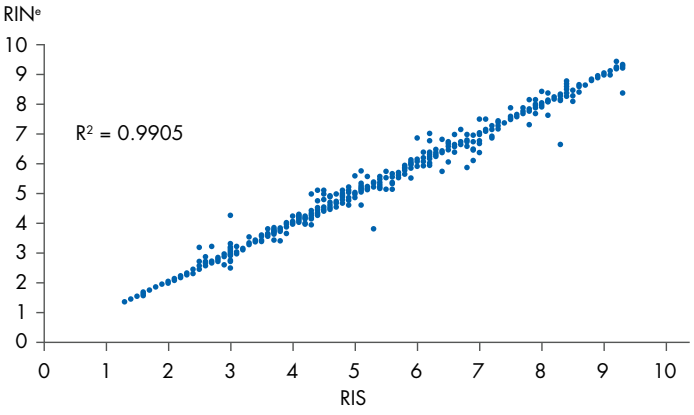

Figure 2. Correlation of RIN^e and RIS.
RNA samples were purified from rat lung, rat liver, and Jurkat cells, and then analyzed in replicates (n=689) on the Agilent TapeStation 2100 and the QIAxcel system.
The RIN^e and RIS values of the RNA samples were plotted to establish correlation (3).

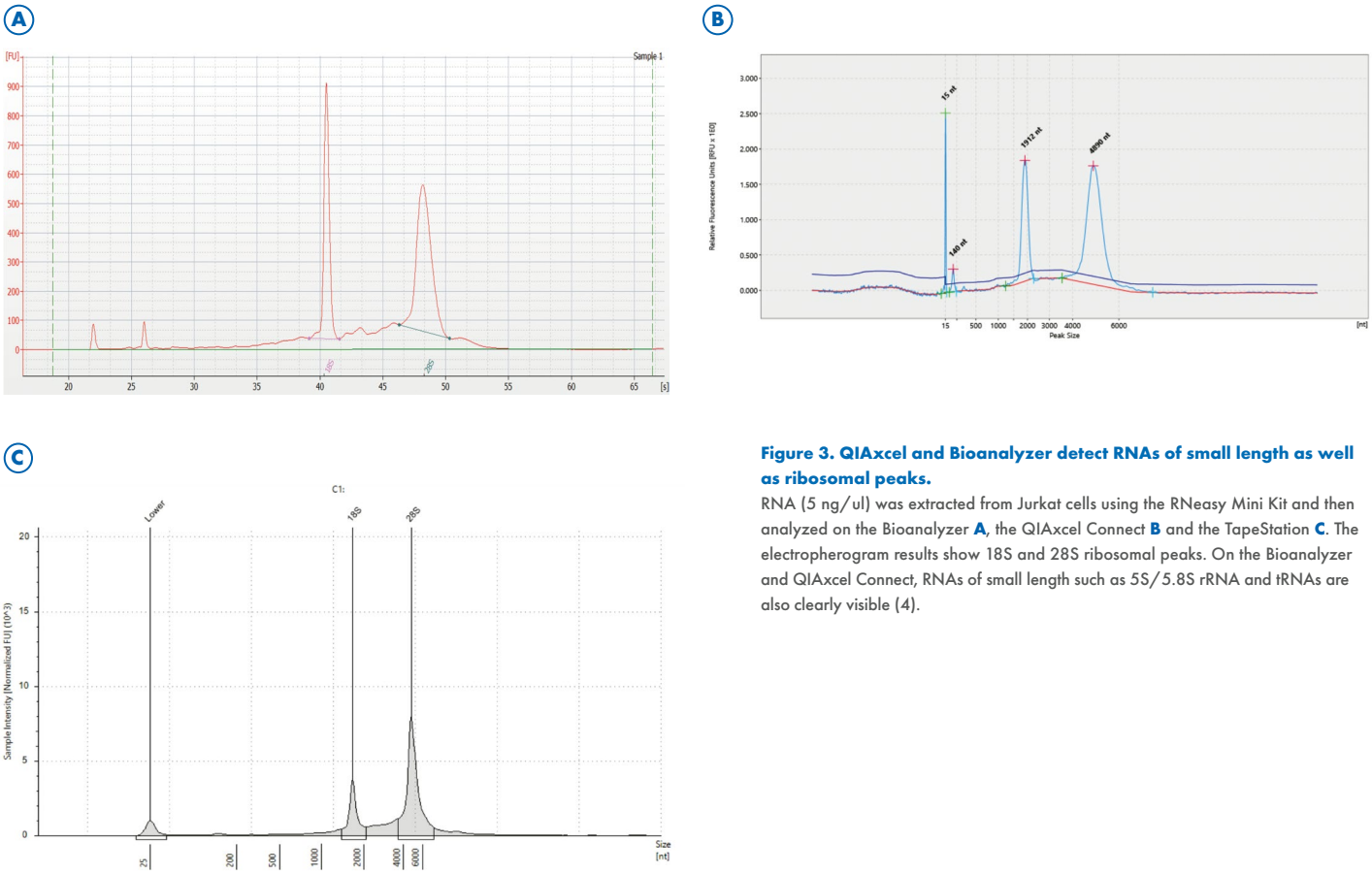

Figure 3. QIAxcel and Bioanalyzer detect RNAs of small length as well as ribosomal peaks.
RNA (5 ng/ul) was extracted from Jurkat cells using the RNeasy Mini Kit and then analyzed on the Bioanalyzer **A**, the QIAxcel Connect **B** and the TapeStation **C**. The electropherogram results show 18S and 28S ribosomal peaks. On the Bioanalyzer and QIAxcel Connect, RNAs of small length such as 5S/5.8S rRNA and tRNAs are also clearly visible (4).

References:

1. Unger C, Kofanova O, Sokolowska K, Lehmann D, Betsou F. Ultraviolet C radiation influences the robustness of RNA integrity measurement. *Electrophoresis*. 2015;36(17):2072-2081. doi:10.1002/elps.201500082
2. Pfeifer-Sancar K, Kozulic M, Ferdinand PH. A combinatorial approach to nucleic acid quality control for efficient workflow standardization and reliable data generation (White paper). QIAGEN. www.qiagen.com/PROM-11256
3. QIAGEN GmbH. RINe-RIS comparison. 2021.
4. QIAGEN GmbH. Electropherogram results. 2022.

Learn more about QIAxcel Connect technology at **www.qiagen.com/QIAxcel-Connect**

The QIAxcel Connect and QIAxcel Advanced are intended for molecular biology applications. These products are not intended for the diagnosis, prevention or treatment of a disease.

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