SARSTEDT

S-Monovette®
RNA Exact

For the standardisation of gene expression analyses

Life Science

At a glance

- Gentle aspiration technique
- Immediate & limitation-free RNA stabilisation
- Optimum compatibility with commercially available isolation kits & significantly faster RNA isolation
- Valid analysis results due to maximum RNA yields

RNA analysis is becoming increasingly important and is used in a variety of ways. By determining the expression patterns of specific genes, it is now even possible to assess disease stages or prognoses of disease progression.

The new S-Monovette® RNA Exact makes it possible to acquire a sample volume of up to 2.4 ml.

The immediate stabilisation of all RNA standardises sample collection for RNA-based analyses and enables the blood sample to be transported safely to the laboratory for analysis.

The preparation prevents both the degradation of the RNA and the unnatural re-synthesis of RNAs after sample collection (induction of stress genes).

Advantages of the new S-Monovette® RNA Exact:

- Blood collection possible using gentle aspiration and vacuum techniques (two systems in one product)
- Limitation-free stabilisation of different transcripts and maximum RNA yields
- Significantly faster RNA isolation possible compared to other established systems

Validated & reliable sample stabilisation:

- at room temperature for up to 5 days
- refrigerated (8 °C) up to 14 days
- at -80 °C stable for many years

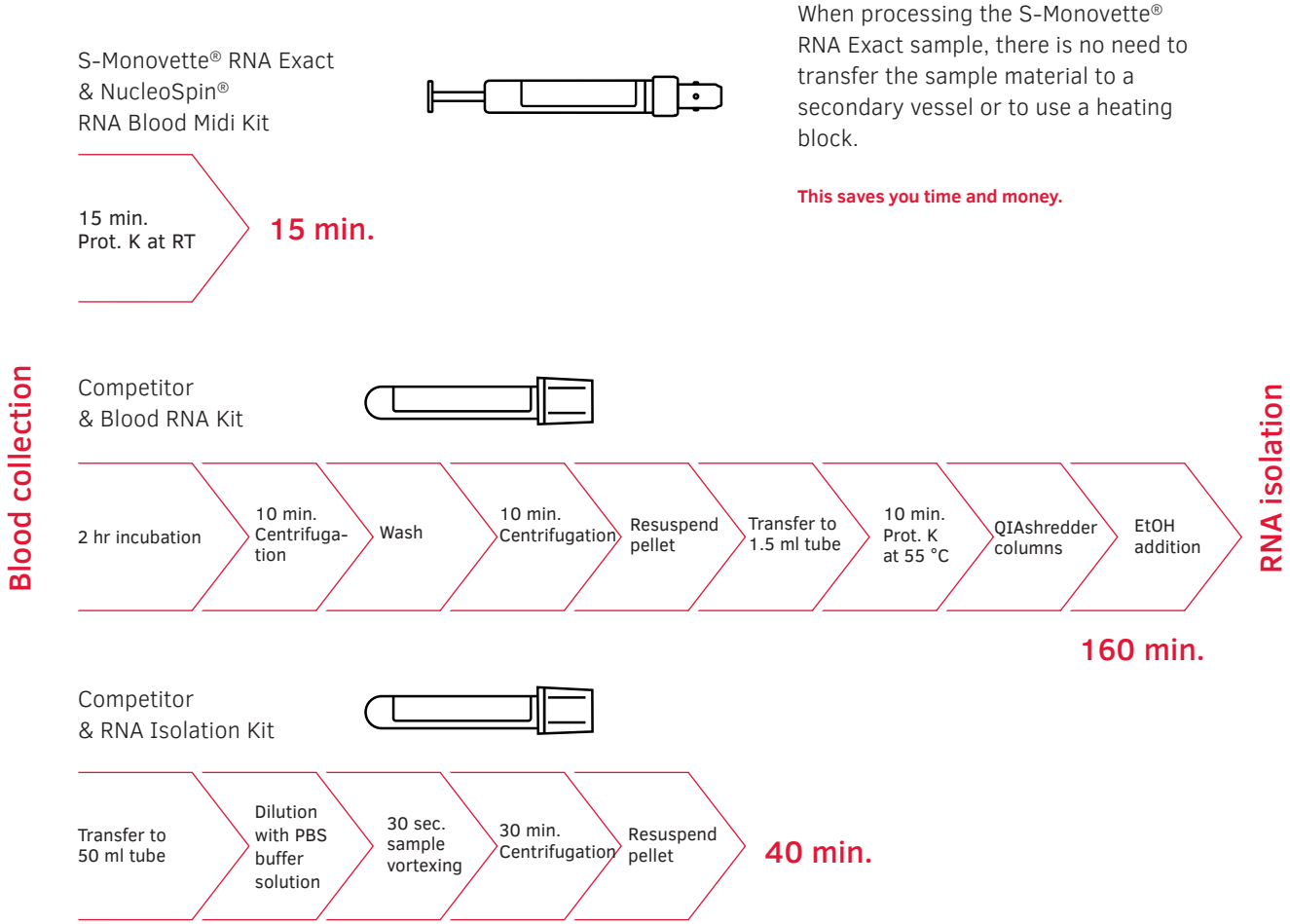
See also Fig. 2–4 on page 5

Save time during manual sample preparation

The sample material from the S-Monovette® RNA Exact can be used directly for RNA isolation. There is no need for time-consuming sample preparation.
Since RNA isolation does not require initial RNA pelletisation, time-consuming incubation and centrifugation steps are no longer necessary.

Direct RNA isolation and significantly faster sample processing reduce the time until the result is ready.

The following diagram illustrates the time saved:



Flexible choice of isolation system

A major advantage of the S-Monovette® RNA Exact is that it is not bound to one specific isolation system. The freely selectable isolation systems listed below are optimally matched to the S-Monovette® RNA Exact. The flexibility in the selection of the isolation system means that maximum RNA yields can be achieved at reduced costs.

Since an initial centrifugation step is not necessary, the RNA Exact samples – unlike in other systems – can also be processed automatically with ease.

Maximum RNA yields with outstanding stabilisation performance

Due to their biological function, many RNA molecules are rapidly synthesised by the cells, then quickly degraded again. It is known, for example, that the expression of **IL-8** in the cells of the blood sample increases significantly after a blood sample is taken [1]. Furthermore, RNA also degrades very quickly due to ubiquitous enzymes (RNases) or the effects of heat.

Therefore an RNA stabiliser must have a dual effect; on the one hand, re-synthesis of RNA must be prevented after blood collection and on the other, the stabiliser must inhibit any RNA degradation.

The stabilisation performance of the S-Monovette® RNA Exact was compared with that of an EDTA blood sample and two competitor RNA-stabilising products. Fig.1 shows that the highest RNA yield is achieved using the S-Monovette® RNA Exact (storage temperature 22 °C).

1. Manual isolation systems

- NucleoSpin® RNA Blood Midi Kit, made by MACHEREY-NAGEL, REF 740210.20
- NucleoSpin® Dx RNA Blood, IVD kit for RNA isolation from S-Monovette RNA Exact, made by MACHEREY-NAGEL, REF 740201.50
- NucleoSpin® RNA Blood Mini Kit, made by MACHEREY-NAGEL, REF 740200.50
- MagMAX™ mirVana™ Total RNA Isolation Kit, made by Applied Biosystems™/ ThermoFisher Scientific, REF A27828
- Total RNA Purification Kit Dx, made by Norgen Biotek Corp., REF Dx17200

2. Automated isolation systems

- chemagic Total RNA 9k Kit H24, made by Revvity chemagen Technologie GmbH, REF CMG-1084-S
- NucleoMag RNA Blood Kit, made by MACHEREY-NAGEL, REF 744352.1
- Maxwell® CSC RNA Blood Kit, made by Promega Corporation, REF AS1410
- MagMAX™ mirVana™ Total RNA Isolation Kit, made by Applied
- Biosystems™/ ThermoFisher Scientific, REF A27828

Fig. 1

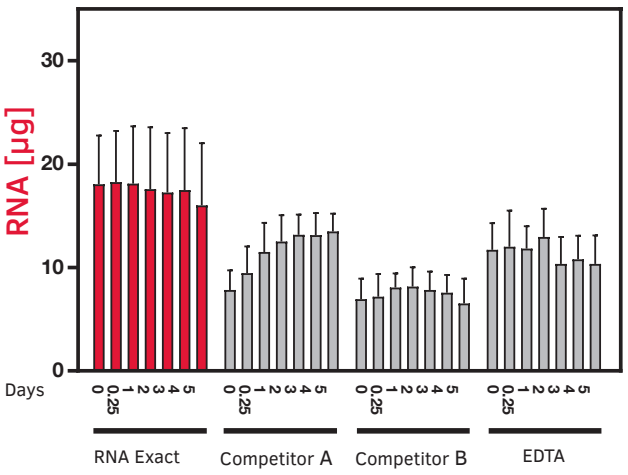
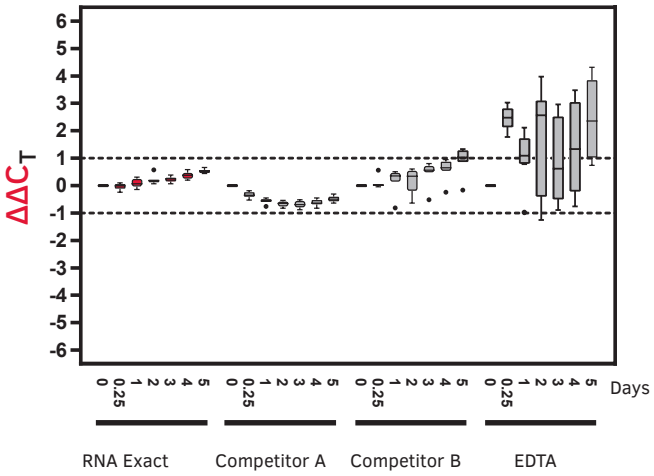


Figure 1 RNA quantities from 4 different blood collection tubes over 5 days, at 22 °C: S-Monovette® RNA Exact, Competitor A, Competitor B, S-Monovette® EDTA.

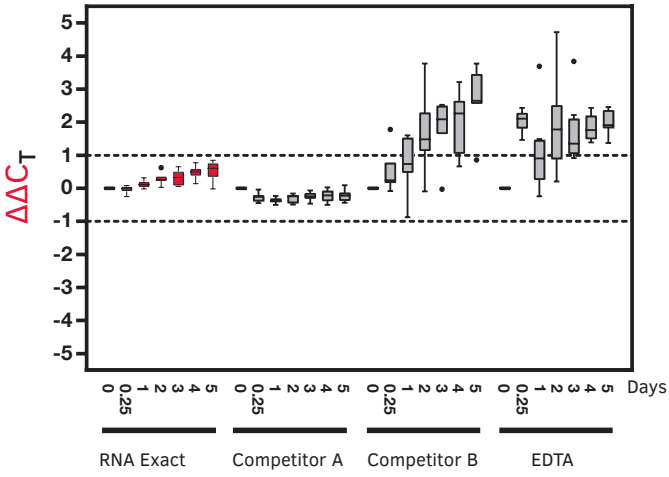
IL1B

Fig. 2



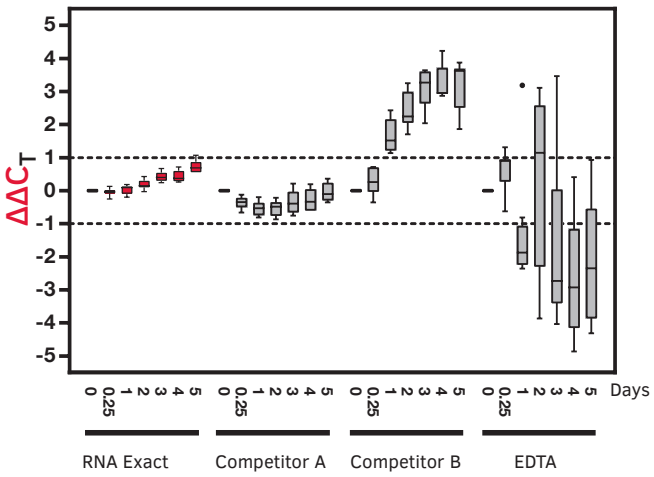
FOS

Fig. 3



IL8

Fig. 4



Figures 2, 3 & 4 show examples of the outstanding stabilisation performance of the S-Monovette® RNA Exact using qPCR analyses of the genes IL1B, FOS and IL8. The S-Monovette® RNA Exact preserves the gene expression level at the time of sampling (ΔΔCT<1, storage period 0–5 days, storage temperature 22 °C).

More detailed information and other analysed genes are presented in the white paper "Impact of RNA Stabilizing Blood Collection Tubes on Gene Expression Data Validity – A Comparison of S-Monovette® RNA Exact, PAXgene™ Blood RNA Tubes & Tempus™ Blood RNA Tubes", which can be downloaded free of charge from the SARSTEDT website.

Stabilisation

of at least 47,000 transcripts with the S-Monovette® RNA Exact

RNA-stabilising blood collection systems established on the market exhibit limitations with regard to an equivalent stabilisation of all transcripts [2]. The RNA-stabilising performance of the S-Monovette® RNA Exact was analysed by an independent laboratory using the HumanHT-12 v4 BeadChip (REF BD-103-0204, Illumina San Diego, USA) to verify the stabilisation of the largest possible number of transcripts.

Figure 5 shows the result of the cluster analysis. The analysis shows clustering by time point for EDTA samples (no RNA stabilisation). The change in transcripts over the storage period is greater than the biological variability between donors. This means that non-stabilised EDTA samples are affected by the storage time. The samples stabilised by the S-Monovette® RNA Exact cluster by donor and not over time (including day 0 samples). The change in the expression pattern over time is less than the biological variability between donors. The RNA chip analysis thus shows very good preservation of the expression pattern across the measured time points.

The S-Monovette® RNA Exact samples stabilise all 47,000 analysed transcripts of the HumanHT-12 v4 BeadChip over a period of at least 3 days.

Fig. 5

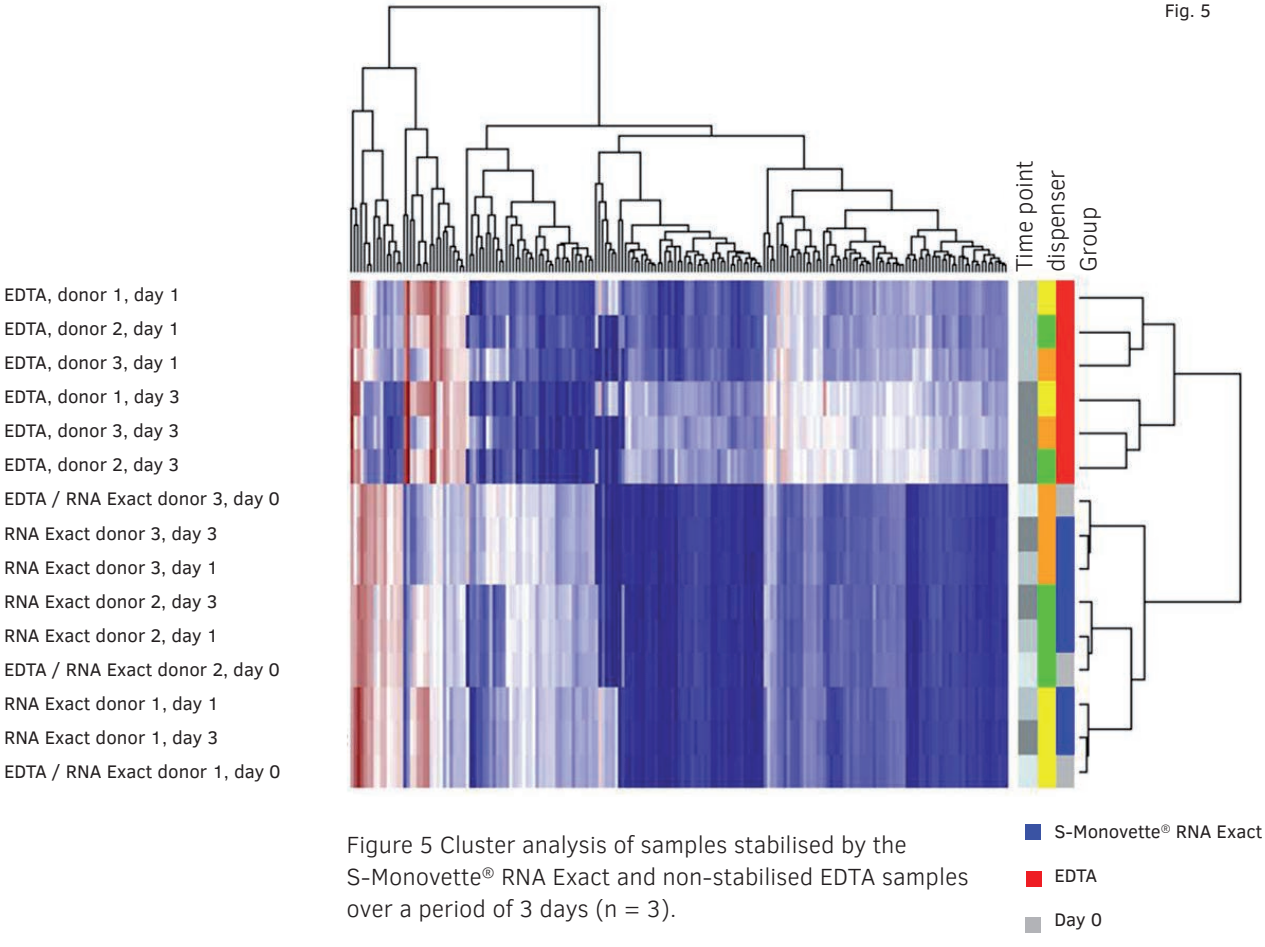


Figure 5 Cluster analysis of samples stabilised by the S-Monovette® RNA Exact and non-stabilised EDTA samples over a period of 3 days (n = 3).

Conclusion

The S-Monovette® RNA Exact makes everyday laboratory work and multicentre studies much easier!

- Filled monovettes can be collected and transported over a number of days before processing, without any loss of quality
- The S-Monovette® RNA Exact has no limitations in the stabilisation of various transcripts
- Maximum RNA yields can be achieved
- The advantages of RNA isolation mean that the time until the result is available is significantly shorter than with other products

Ordering information

Description	Packaging (inner/outer box)	Order no
S-Monovette® RNA Exact ≤ 2.4 ml	20 / 80	01.2048.001

Accessories

Description	Packaging (inner/outer box)	Order no
Safety-Multifly®needle 20G with 200 mm tubing and assembled Multi-Adapter	120 / 480	85.1637.235
Safety-Multifly® needle 21G with 200 mm hose and mounted multi-adapter	120 / 480	85.1638.235
Safety-Multifly® needle 23G with 200 mm hose and mounted multi-adapter	120 / 480	85.1640.235
Safety-Multifly® needle 25G with 200 mm hose and mounted multi-adapter	120 / 480	85.1642.235
Disposable tourniquet tournistrip®	0 / 200	95.1006
Protective container 126 x 30 mm, with suction insert, without closure	50 / 250	78.898
Screw cap for protective container 126 x 30 mm	50 / 250	65.679
Shipping box, small 198 x 107 x 38 mm	0 / 50	95.900
Shipping box 198 x 107 x 50 mm	0 / 50	95.901
Shipping box, large 220 x 170 x 40 mm	0 / 50	95.902

For more consumables for the PCR (PCR plates, chains and individual vessels), pipette tips and reaction vessels, see www.sarstedt.com.

References:

1. Gunther, Kalle; Malentacchi, Francesca; Verderio, Paolo; Pizzamiglio, Sara; Ciniselli, Chiara Maura; Tichopad, Ales et al. (2012): Implementation of a proficiency testing for the assessment of the preanalytical phase of blood samples used for RNA based analysis. In: Clinica chimica acta; international journal of clinical chemistry 413 (7–8), pp. 779–786.
2. Menke, Andreas et. al. (2012). In: BMC Research Notes. DOI: 10.1186/1756-0500-5-1

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we'll be happy to help!

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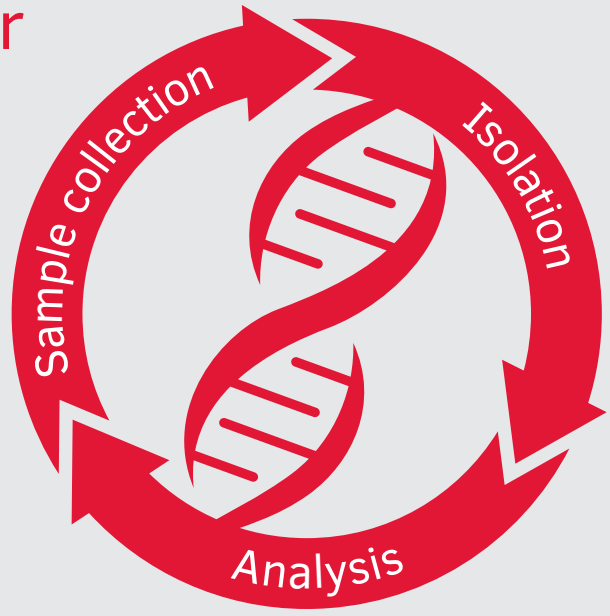
The SARSTEDT molecular diagnostics workflow

Benefit from the advantages of our coordinated consumables!



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