RNA Services
Complete sample-to-answer services by the RNA experts

- Isolation of RNA and exosomes
- Next Generation Sequencing
- qPCR
Welcome to Exiqon RNA Services

Send Exiqon your samples and let us perform your RNA experiments. We offer high-quality RNA isolation, and expression analysis of coding and non-coding RNA using the best available Next Generation Sequencing and qPCR technologies.

All experiments are performed by a team of seasoned RNA experts in state-of-the-art automated laboratories with rigorous quality control and fast turnaround times.

At a glance

- **Comprehensive** all-inclusive RNA analysis services ranging from genome-wide screening to single target validation
- **Flexible** sample-to-answer service tailored to your research needs and budget
- **Complete data analysis** with industry-leading service reports and support
- **Close consultation** throughout your project with experienced RNA scientists
- **Automated** processes for high reproducibility and efficiency
- **>10 years’ experience** with RNA analysis
- **SOPs, LIMS, and rigorous QC** at every stage
- **Track projects via secure web portal**
- **Fast turnaround times** – projects completed in 4-6 weeks

How much sample or RNA do I need?

<table>
<thead>
<tr>
<th>Sample / RNA</th>
<th>Isolation Services</th>
<th>NGS Services</th>
<th>qPCR Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total RNA</td>
<td>N/A</td>
<td>100 ng + 60 ng for QC</td>
<td>65-130 ng + 40 ng for QC</td>
</tr>
<tr>
<td>Fresh frozen tissue</td>
<td>✓</td>
<td>4-5 mg</td>
<td>1-5 mg</td>
</tr>
<tr>
<td>FFPE sections</td>
<td>✓</td>
<td>6 x 10 µm sections of 1 cm²</td>
<td>2 x 10 µm sections of 1 cm²</td>
</tr>
<tr>
<td>Cells</td>
<td>✓</td>
<td>2x10⁶ cells</td>
<td>1x10⁷ cells</td>
</tr>
<tr>
<td>LCM</td>
<td>✓</td>
<td>Please enquire</td>
<td>&gt;1000 cells</td>
</tr>
<tr>
<td>Whole blood e.g. PAXgene</td>
<td>✓</td>
<td>Please enquire</td>
<td>Please enquire</td>
</tr>
<tr>
<td>Exosomes</td>
<td>✓</td>
<td>Please enquire</td>
<td>Please enquire</td>
</tr>
<tr>
<td>Biofluids</td>
<td>✓</td>
<td>500 µl</td>
<td>250 µl</td>
</tr>
</tbody>
</table>

Amounts stated are minimum recommended input amounts. For microRNA and small RNA sequencing of FFPE samples, 1 µg RNA + 60 ng for QC is required. MicroRNA qPCR analysis may be performed on rodent biofluids using 75 µl biofluid. For exosome isolation, larger volumes of biofluid are required. Contact us [exiqon.com/contact](http://exiqon.com/contact) or see Guidelines for more information [exiqon.com/services](http://exiqon.com/services).
It all starts with RNA of the highest quality

**Trusted RNA experts**
High quality RNA is key to getting the best results from your RNA expression analysis project. At Exiqon Services, we have been handling RNA samples for the last 10 years, so we know how to isolate top quality RNA from a wide range of different sample types.

Our experts are on hand to advise you on sample collection and storage. We have also developed specialized protocols for isolating RNA from samples with limited RNA content e.g. biofluids.

**Rigorous RNA Quality Control**
RNA QC is a vital part of every project, whether you send us your samples or the isolated RNA.

Our specialists use different approaches depending on the sample type. For standard samples, the integrity, quantity and purity of each sample is assessed using Bioanalyzer and NanoDrop™ instruments.

**RNA PCR QC**
We offer qPCR-based QC tests to assess the performance of samples prior to microRNA qPCR profiling. RNA PCR QC is particularly recommended for challenging or low RNA content samples.

RNA PCR QC is used prior to qPCR or NGS to assess RNA from biofluid samples, where standard RNA QC is not applicable.

RNA PCR QC includes:

- Quantification of pre-selected endogenous microRNAs and synthetic RNA spike-ins
- Monitoring of RNA extraction efficiency, presence of inhibitors, hemolysis and identification of any potential outlier samples

Arrange a free consultation to discuss your project:
exiqon.com/contact

Unrivalled support

**Close consultation with RNA experts**
We are committed to providing personalized, accurate and responsive guidance from a dedicated project management team throughout your project.

Together, we design an experimental setup that best satisfies your research needs and budget. We can help you tailor the exact level of service you need, to make sure you get on the fast track to actionable results.

<table>
<thead>
<tr>
<th>Service project workflow</th>
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<tbody>
<tr>
<td><strong>Consultation and experimental design</strong></td>
</tr>
<tr>
<td>Experimental design to suit your needs and budget</td>
</tr>
<tr>
<td><strong>Sample submission</strong></td>
</tr>
<tr>
<td><strong>RNA isolation (optional)</strong></td>
</tr>
<tr>
<td><strong>RNA Quality Control</strong></td>
</tr>
<tr>
<td><strong>RNA expression analysis</strong></td>
</tr>
<tr>
<td>Next Generation Sequencing or qPCR</td>
</tr>
<tr>
<td><strong>Data analysis and interpretation</strong></td>
</tr>
<tr>
<td>A wide range of analyses and biological interpretation</td>
</tr>
<tr>
<td><strong>Project report, consultation and next steps</strong></td>
</tr>
<tr>
<td>An extensive report and follow-up scientific discussion</td>
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</tbody>
</table>
Exiqon performed microRNA and RNA sequencing from the exact same samples.

Send us your biological samples and we will prepare high quality total RNA suitable for Exiqon’s NGS and qPCR Services, using Exiqon’s miRCURY™ RNA Isolation Kits.

We can handle a broad range of sample types including clinical samples, tissue and FFPE samples, cells and biofluids.

We have protocols optimized for samples with minute RNA content, including an automated RNA isolation protocol optimized for Biofluids qPCR.

We also provide high quality exosome recovery from a range of biofluids using miRCURY™ Exosome Isolation Kits.

NGS enables the discovery of novel RNAs as well as global expression profiling. Our NGS experts offer a complete solution from isolation to data interpretation and validation.

Using market-leading Illumina technology (HiSeq, NextSeq and MiSeq), we have flexible capacity to handle all projects from small to very large.

We sequence samples from a wide range of different organisms, and also offer custom sequencing projects. The unique combination of our RNA expertise and advanced bioinformatics pipeline means we deliver top quality RNA sequencing data with the highest mapping percentages.

<table>
<thead>
<tr>
<th>RNA-seq from microRNA to the whole transcriptome</th>
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<tbody>
<tr>
<td><strong>Non-coding RNA</strong></td>
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<tr>
<td>microRNA / Biofluids microRNA</td>
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<tr>
<td>Sample preparation</td>
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<tr>
<td>RNA isolation</td>
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microRNA qPCR Services

A complete microRNA qPCR service using Exiqon’s highly sensitive and specific miRCURY LNA™ Universal RT microRNA PCR System – performed by those who know the system best.

Analyze any number of microRNAs - from the full miRNome, to a range of Focus PCR panels, or a custom subset of microRNAs including novel microRNAs. Such flexibility makes the qPCR Service ideal for validation of NGS or microarray data.

qPCR Services are suitable for all sample types, but the unrivalled sensitivity of our microRNA PCR system makes it ideal for biofluid samples with limited RNA content.

We operate the largest qPCR facility in Europe, with high throughput robotic pipetting stations and a template-free environment for set up of qPCR reactions. High quality data is assured through our rigorous QC and unique automated data QC pipeline.

From discovery to validation with Exiqon Services

<table>
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<tr>
<th>Discovery phase</th>
<th>Validation phase</th>
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<tbody>
<tr>
<td>Genome wide screening</td>
<td>Validation set/RNA signature</td>
</tr>
<tr>
<td>NGS or PCR profiling</td>
<td>Custom PCR panels</td>
</tr>
<tr>
<td>Identify subset of relevant RNAs</td>
<td>Identify candidate RNA biomarkers &amp; endogenous controls</td>
</tr>
<tr>
<td></td>
<td>Signature identification</td>
</tr>
<tr>
<td></td>
<td>Assess signature performance</td>
</tr>
</tbody>
</table>

"The flexibility of Exiqon’s qPCR system allows us to identify and focus on the microRNA that carry information."

Rapid, high quality results

Automated workflows designed for success

Our scientists work in state-of-the-art facilities following strict Standard Operating Procedures. Your samples and all reagent lot numbers are tracked using a Lab Information Management System (LIMS).

We use automated workflows and high-throughput robotic pipetting stations for maximum reproducibility and efficiency. Rigorous QC at every stage of the analysis ensures reliable results delivered in just 4–6 weeks.

"The speed you need, with complete peace of mind."
**Industry-leading reports**

**Comprehensive data analysis**
We provide an extensive analysis of the data, including unsupervised and supervised analysis, and differential gene expression analysis with statistical analysis according to your defined group comparisons.

**The final report includes:**
- Easy-to-read data summary report
- Project summary Excel report
- Publication-grade illustrations (heat maps, PCA plots, Volcano plots etc.)
- Complete raw data

In connection with large service projects we also offer extensive customized bioinformatics analysis.

**Post-project consultation**
Our bioinformaticians will walk you through the analysis, and answer any questions you may have.

We are happy to discuss with you the biological meaning of the results and the next steps for the project including validation or functional analysis.
Principal Component Analysis (PCA) is a method used to reduce the dimension of large data sets and thereby a useful way to explore the naturally arising sample classes based on the variation. This leads to separation of samples in different regions of a PCA plot if the biological differences between the samples are pronounced, this will be a primary component of the variation. By including the top 50 microRNA that have the largest variation across all sets and thereby a useful way to explore the naturally arising sample classes based on the expression profile. If the expression data have been plotted in a Volcano plot to enable quick visual identification of those microRNAs that display large-magnitude changes that are also statistically significant (see below). The volcano plot is constructed by plotting the p-value on the y-axis, and the fold change (ddCq) between the two experimental groups on the x-axis so that up- and down-regulations appear equidistant from the center. Plotting points in this way results in two regions of interest in the plot: those points that are found towards the top of the plot for either the left- or the right-hand side. These represent values that display large fold changes (hence being towards the top) as well as high statistical significance (hence being towards the top).

Data quality control

Exiqon Services has developed a rigorous and automated PCR data QC pipeline to achieve maximum benefit of our SYBR® Green based miCRYUR LNA PCR assays. Each individual amplification product on our PCR panels is scrutinized by a consistent high quality data set.

Melting curve analysis

An additional step in the real-time PCR analysis was performed to evaluate the specificity of the amplification products by generating a melting curve for each reaction. The appearance of a single peak with the expected Tm is an indication that a single specific product was amplified during the qPCR process. PCR reactions that gave rise to multiple melting curve peaks or single peaks with melting temperature that was inconsistent with the expected Tm for the corresponding assay (in-house database) were flagged and removed from the dataset. This ensures that the data analysis is performed on a consistent high quality data set.

Exiqon Services have years of experience profiling circulating microRNA in serum and plasma and other biofluid samples. As part of our own microRNA biomarker discovery programs, Exiqon has pioneered the analysis of microRNA in biofluids.

- >15,000 biofluid samples processed
- Extensive knowledge of pre-analytical variables
- Specialized sample and data QC procedures
- Unique hemolysis indicator
- Reference ranges for circulating microRNAs

This knowledge has been applied in establishing optimized protocols and special QC procedures for biofluids in our microRNA NGS and qPCR services.

Our ground-breaking Biofluids microRNA NGS Service offers protocols and QC procedures specifically optimized for microRNA sequencing clinical serum / plasma samples, enabling the discovery of novel microRNA biomarkers in liquid biopsies.

Our microRNA qPCR Services use the miCRYUR LNA™ Universal RT microRNA PCR System that was designed with biofluids in mind, and has been thoroughly validated on thousands of clinical biofluid samples.

Learn more at [exiqon.com/biofluids](http://exiqon.com/biofluids)