

# The Advantages of Automated Nucleic Acid Extraction



## Written by

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Researchers from all life science disciplines rely on nucleic acid extraction to initiate experiments in applications from basic research to more complex ones including biomarker discovery, cell free diagnostics, epidemiology, and microbiomics. Once extracted, the nucleic acids are most often subjected to very sensitive quantitative techniques such as next generation sequencing (NGS) and qPCR. Given the sensitivity of these techniques, even minor variations or inconsistencies in sample preparation and downstream analysis can significantly impact results, leaving you with data that may not be reliable.

One important source of variation is manual sample handling. This poses the risk of pipetting errors, as well as protocol deviations that may occur when working with large sample numbers. For example, by the time a given step has been completed for all samples in a set, the first sample has exceeded the maximum standing time for that step. This scenario may prove critical when working with fragile nucleic acids such as RNA. Fortunately, you can circumvent the risks of manual sample handling by automating nucleic acid extraction with a pipetting robot, thus ensuring greater consistency and reliability and better quality data overall.

Besides the reasons listed here, automated extraction should also facilitate inter-laboratory research, since the impact of human intervention and error is greatly reduced, leading to greater data consistency and reliability.

If you're considering automation for your lab, get in touch. We'd be delighted to help walk you through it.

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## 5 Reasons to Automate Nucleic Acid Extraction

### 01 Streamlined extraction process

Accurate and consistent pipetting with an automated protocol helps to achieve uniformity in key sample processing steps such as lysis, washing, and elution.

### 02 Less manipulation, less contamination

Fewer manual handling and pipetting steps reduce the threat of external contamination and sample-carryover risk, whether or not the protocol is executed in a sterile workspace.

### 03 Throughput and scope

With automated nucleic acid extraction you can process larger sample numbers with greater speed, thus increasing your throughput. This also creates an opportunity to broaden the scope of your research by testing a greater number of test conditions, drugs, study participants etc.

### 04 Time-saving

This is two-fold. Manual nucleic acid extraction requires the undivided attention of trained staff. Automation allows for more walk-away time for the researcher while the robot takes care of the repetitive work. Automated protocols are also generally faster than their manual counterparts (in terms of time spent per extraction), thus further speeding up your workflow.

### 05 Seamless workflow

In many cases, it is possible to integrate an automated nucleic acid extraction protocol with the intended downstream application(s), e.g., automated extraction followed by PCR preparation and purification, leaving you with a perfect plate of samples that is ready for downstream applications.